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GGGACTGGGTTTGGGTGGGTAGAATACGGCGGCGAGAGGTACAATCACGATAT
TTACGTGACAACCGAAGGGAAGGTTACCGGCGTGAGAAGGGACTCTCCAGGA
50 GTAAGTTCGGCACCGACGATAACCTGGCGGGCCGACGAGTTGAGACGACTCCTG
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5 TAGTCTCCAATCCGATACGCCTGAGGGAGCAAGTGTGTGACGAATACTATGGTC
ACTTCTCCTTTGAGCTCCATGACTGTCTCCTCGATTTTCTCCTGCTCGCAATCGGGT
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AGCTCTCGCGATACAGAGCCTCTGCTGTTGACCACCGGATAGCGCTGAAGCCG
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10 TCGTACACGCGGTCTTCGATCTCATCCTCGTCCATACCCATCAGCCGGAGTCCG
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15 GATGGTCCATGATGGTGGTGATCTTCTTTCTGGAATATCCAGAGTGATGCC
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20 ATAAATGCGGAACGCCAGCGCGTCCGGTAGGCTGGAGCACGTGAACGAACGGG
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25 TCCTCACCATCACTGGGAGATTCATGACTGCCAACGTCAACGCTCCTGCGAGGA
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35 ACACCGGTTACCATCAGCATCAGCACGAGGCCTCCGAAGTACAGAGCGTAATA
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40 TGCCATCGAGTCGCTCCCATTCCTCAACGCGGCCTCCACGTACTCTCGCGGAAC
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45 TGGAGCGAACTCGGCCAGATAAGTCGCGCAAAGCAGCGAAATCGGGAAGGCTA
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50 TTAGATTCTCAGACTCCTGGGCTTGCTTCGCGGCAACTTCCCGCATCACTGGTC
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GTGCATCCTCGGGTACCGGGACGTATCCCACCTTCTCCGCGAACTCCTTGTTGA
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5 CGGCACCTTACCGCCCTTCTTGGCTTTGACGACGTAGGCGTAATCCACGTAACC
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GAGGATGGCGTCCTTGGTGTAACTCTGGATGTTTAGGTACTTGTCAAACGTTGA
CCGCGTGCCTGAACCCCTTCGCACGACCGATTACGACGATTTTCTTGTGTGGTAG
ACCCGGCTTCACCTGATCCCAGTACTTGATCTTACCGGTATAGATGTCCCTAAG
10 CGTCTTCGGGTCGATGTCGTCTAACTGGCCTAGCGTCTTCCATTACGATCGG
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15 CGGTGTTCTTCACCGACATAAGCTGCAACCTTCATCATAAATGGCATTAGACTC
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20 TGCCGGATTTGCGGAATACCTGAGACCGTTGACGGAGTAGAACTGGACGAAAG
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25 GCCTGGCGGAGGATAATCCTGGCTCGGAGGATGTCTGGTATAGAGTGGGAAAT
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CGGGACGTACCTGTGGTCCCCAAGGACCCACCGGTGATTAGAGCGATGTGTG
30 GAATGACGGAAAACGAGCGCCGGGAAATCGTCGAAGAAGAGTTCGAGACTGACT
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35 AAGCTTAAACAGATGTTACAGAAGGTTATCAACAAGATATCAAATTCGGATCTT
GGACGCGAAAAATGGGGACTAAAATCACTTTCAGAACTTCTGGAGCTTTTAAGGA
AAAAAGTTAGTGGCAAAAAAATTTGTGTTCTGATTTACAGGCGGGATGGATAGTG
CTGTTGCAACGAAGATTTTACAGTTGTCTAATACCGATGTGAGAGGACTTCATAT
AACACATAGATGGATGTGGTTCACGCCGGAGATTGAAATCAAACGAATATCTAA
40 AATGCTCGGGATTAAGATAGACGTTGTTGATATAACTGATGAGTTAAGGCGTAG
ACTTCGAGGTGCTAAAGGCAAATCTGTGTGTAAAATATGCAAGAAGATTATGTTG
GAGATAGCTGTTAGTAAGGCCAGTGTTGTGGCCACGGGAGAATGTGGTATGGA
CACCATAGCGGGTGCCGTTTTGGACGTGTGAGGCGAACC GGATCGAACCG
GAGTTCGTCCAGTTGCCCAAGAGGTA CTCAACGGAGACGATCGCATCATCGT
45 GCGGCCGCTGATCCGCATCCACGAGAGCGACGTGAAGAGGCTCGCCAGGCTT
CTAGGTGTGAAAGTACGACGGGTGCGGGAGACCGGGGATCTCCGTAGGGGAC
GCCGTGAAGGGTGTCCGCTCCAACACCTGGACCCGTGGGTGGACGTTACCGAT
GAGCTGATGGACGAAGTCTGGGACGTCAACGTAGAGGCGTTACTCGTAGCCAG
GAGGTTAGGGCGTCGGGTATCCGTGAAGTGGCCATCGTTCAGGATCATATTGG
50 AAGGAAGTCCCGAAGAGCGACGTACGTTGCGGAGTGTGTCTGGTACAGGTGG
GTTTCGAGCTGGAAGACCCCGCCGGTACAGGTAGAGTCCTATCGTGGCTATCAA
CGTTACCGCGACTATCAGCGCCGCCACCGATCCCCAGCCTGAGACTACGGGTT

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GCGCGGTGGTCACTGATGTCGCCGTCGAGCCGCGACCGTACCCGCCCGCACC
5 GGTGTTCCGGAGTACCTCCACCCGCAGCGACTCGTCTGGATACATGGGCCGTGG
TAGACCTCGACGTGGAGTACCCCGCAGGATGTTCTTGACGACTGTGGTCGCA
CCACCACGAGGGTGTTCCGGTCTCGGATCGCGTCACGGTTCCTCCCGGAAGTCCT
TCCGGAAGGTTGTCTAGGTTCCGTCG

Attachment B

<SEQ ID No.:0001;PRT;Methanopyrus kandleri>

5 MSLEIDGSYGE GGGQILRTAVGMSALTGEPVRIYNIRANRPRPGLSHQHLHAVKAV
AEICDAECEGLEIGSTEIVFEPGKVKGGGEYEV DIGTAGSVTLLLQAVKLA AIAADGPV
EMEV RGGTDVKWSPPV DYEINVNAHYLDRLGYRYELEVLRRGHYPRGGGIVRARM
EPPKRLKPLEAVKFGELSVRGISHCVRLPPHVAERQAKAASEI IERELGIRPEIEIET
10 YPKGRD PHLGPGSGIVLWAEDDQGNRIGADALGEKGKPAE VVGREAAEQLVQRLR
TGMALDEHMGDQILPFLAIADGESVFGVTGVDPHLP TNAWVVEKFLPVSV EIRGKE
GEPATVEVRPEG

<SEQ ID No.:0002;PRT;Methanopyrus kandleri>

15 VGVIEDMMKVGMRSAGLEATEELIKLFREDGRLVGSILKEMEPEEITELLEGASS
QLIRMIRSLHTPAVDVFERSGEFVIVAEVPGARPEDVQVRAGERFVEITANIPKMRE
GEAKTRERTVGEVRRRIDLPEKINPSAVSAKCGRGLLIVRAPKAEASEIEVKPMEEE

<SEQ ID No.:0003;PRT;Methanopyrus kandleri>

20 VSGNPFRKMPEVPDPEELIDVAFRRRAERAAEGTRKSFYGT RTPPEVRARSIEIARVN
TACQLVQDRLWEIVRKTPNLDELHPFYRELADALAGIDRLKSSLADVHTVAKIARLIR
EEYTRKIKRARDPRTAAELRRQAFGRLASTIRRKVG DALRFLRKVQPKLVDLPAIDT
EMFTVTLAGFPNVGKTTLMTVLTGSRPEIAPYPFTTKGIQVGYMER PYPVQMLDTP
GLLERPEEERNPVERQAIAALKHVTDAVLFLIDPTGT CGYPVEEQLELLDRVRKEFD
25 VPVYVVLTKADLRDLWEEPDLGEPVYKVSATERTGLKELRELLNDLARGHYSGRD
RGHDEGRDEER

<SEQ ID No.:0004;PRT;Methanopyrus kandleri>

30 MEYIYAALLLHAAGQEINEDNLRKVLEAAGVDVDDARLKATVAAL EEEVDIDEAIEEAA
VPAAAPAAAAPAE EEEEEEEAE EEEEEEEEEEEEEEEAAGLGALFG

<SEQ ID No.:0005;PRT;Methanopyrus kandleri>

35 LVPWVEKYRPRSLKELVNQDEAKKELAAWANEWARGSIPEPRAVLLH GPPGTGKT
SAAYALAHDFGWDVIELNASDKRTRNVIEKIVGGASTSR SLLRMTREAGGDYEHVE
GHSDRVLVLVDEVDGIDPREDRGGVTALTRAVRQARNPMVLV ANDPWVLPKSLRD
AVRMIEFRRLRVNDIVEALRRICEREGIEYEEVALRRIAKRARGDLRAAINDLEALARP
TGRVTSDDVEALGWRDKEITIFEALGRIFNKPPRQARRALWNLDEDPDDVILWIAQN
IPRAYSDPEE IARAYDYLSKADV FSSRAIETGDWRFKYVYATDLMTSGVAAARKGKP
PGFVRFQPPKILRKLGTTTRKEREVRNSIAKKIAERMHVSTRRAKMDVISVLEIAFRKV
ADNPTDRGLEILGGIAGYLELSKREIGFLCGDPQVAQRVYQRALRVREKL RKIRRER
40 VKGAMESMLERKREESEVEEEAKEIEEAVEKA EEEEEEREKKKEGGGEQRTLDAFF

<SEQ ID No.:0006;PRT;Methanopyrus kandleri>

45 MAEHEL RVLEIPWVEKYRPKRLDDIVDQEHVVERLKAYVNRGDMPNLLFAGPPGTG
KTTAALCLARELFGEHWRDNFLELNASVSADTPILVRRGGEVLRVTFEDLDSWYFG
DRGGEYVDVSDLEVLTVDNRNFRVTWARVSKLIRHRARKILRVHLEDGTIELTGNHAV
MVLDEGGLRAVKASEIEEGSFLLSFVAELDEQPTDGGTVVTSV GSGSRVSDTTYEL
PVEVRVELLRELADDGVIEASEDVSDLAWLARISGVESRVTD DGVELWETRTGD
LLPADPV LKLVERLES DLVDDLESWVFDGRVSKEAVRKVLSSVD AKNLRGDARRAY
RMLRTLVRSDVHAVKVEDLDVMDYDGYVYDVSVPGNEMFFAGEVPVLLHNSDERG
50 IDVIRTKVKNFARTRPMGGARFKIIFLDEADNLTRDSQQALRRIMEMYS DACRFILAA
NYSSAIIDPIQSRCVVKFTKLPESA IKERLRKIAESEGV EITEDALDAIVYVSEGDMR
RAINVLQAAAAALGREIDEDTVFQIAATARPEEVREMIHHAWNGDFERARELLHELLT

RYGMSGEDVVRQVHREIFDMDEIPEEAIPELVNAVGDFFEYRLIRGSDERIQLEALLA
RIHALGNEYS GG

<SEQ ID No.:0007;PRT;Methanopyrus kandleri>

5 LVEIKEIGEVS TEETSPGAHSHITGLGLDENLKAKPVGDGLVGQEEAREAAAGIVVEM
VKQGRRAGHGLLLVGPPGTGKTAIAYGIARELGEDVPFVSISGSEIYGTNLSKTEFL
QQAIRRAIGVEFTETREVIEGKVESLEIERAKHPLSPYMEVPSGAIIEELKTQDDHRRF
KVPEEIAIQLVQAGVREGDVIQIDVESGHVTKLGRAKDALEEEEEELLGVHAVELPE
GPVQKKKEIKRVVTLHDLDMANVRAGRLLGFREEITDEIRQKVDERVQKMVDEGE
10 ASLVPGVLFIDEAHMLDIEAFAFLNRSLEEEIAPILVMATNRAMAKVRGTDEEAPHGI
PGDLLDRMLIARTRPFERHEIHEIIGIRARVQDIQLTDEAHEYLTDLGEEKSIRYATRL
EPARIVAEKEGSEVVEKKHVERVEEVFTDVS DSVEYMERMRRELPMKYLTG

<SEQ ID No.:0008;PRT;Methanopyrus kandleri>

15 MGTPEGIDVITVVI SEAPYGQERAYTALRFALTALVEGEEVKIFLIEDGVFLGKKGQN
PDEVPNYLELLEQCIEQGAEVKACGPCSKARGLSEEDFIEGVELATMHDLVNWWKE
SDNVIFF

<SEQ ID No.:0009;PRT;Methanopyrus kandleri>

20 VYVATWTGPGLDTPNPETNCWTT SVWDVKWWNSHLDEVPVKEQIELIPVKDISR
WRRILYTGVDPTGHRIDVYVPGGWRPEEHWGSDWDDLRLWAQLHLGIGYVGIC
AGATTFIRAFPCVWSVDGLKGHALPEVLLPHPANPLVQEGESRVIRMYANGPGM
EWKRGWYTIKYIDKKLHKIKAYCDVQGV MKYLEHVKGWAYVAGRWIVDGVKEGR
FVMSVHPEIMGRKDKDPDMVQTFIYAILWAAKRLPSGWKIHLTDLKTLVGVG EAVK
25 VVRLVNSVGAPIADFSPIWVKVVGPEGEEHVLTNNEEGKATLTVPPESEGLYRIE
ASAVDVQATGSFSVGIPPVPFPVVTGVLIAAILGIVVTPRRVRQSSQG

<SEQ ID No.:0010;PRT;Methanopyrus kandleri>

30 VEPDELIEELELRKRPRGTVLLCGIGRLGFRVFLRLLETHRGGPKRIVCVDGQRV EP
DDIIHLRHGARIGENKA EFAARLGRVHPLREVHAEPEFVTEENASELVDTWEPDVV
ITIAGGRTPVTAALAREARRFGAVTVSTGGVFGYGSEEV RVVQLEEAEGPVAREL
REYGAPSDHVLVTTGRYIRD PDPPIPMVLERVADELTELALRALSNPSRGDDDS

<SEQ ID No.:0011;PRT;Methanopyrus kandleri>

35 MTVAKAIFIKCGNLGTSMMDMLLDERADREDVEFRVVGTSVKMDPECVEAAVEM
ALDIAEDFEPDFIVYGGPNPAAPGPSKAREMLADSEYPAVIIGDAPGLVKDEMEEQ
GLGYILVKPDAMLGARREFLDPVEMAIYNADLMKVLAATGVFRVVQEAFDELIEKAK
EDEISENDLPKLVIDRNTLLEREEFENPYAMVKAMAAL EIAENVADVSVEGCFVEQD
KERYVPIVASAHEMMRKA AELADEARELEKSND AVLRTPHAPDGKVL SKRKFMEDP
40 E

<SEQ ID No.:0012;PRT;Methanopyrus kandleri>

45 VLRVATAECFTHGFGV GREIHASASGYTGELGSEILGTELEGKVS VVAACFIPTV SGL
RSLLGIDPPEPDEVSKSGAKAYREETDRKVAVMMARAVRERTGADV GIGTTAGIGR
GAICLDDGEITLLGR TDVHANLLKPDERIRKRQLQG IKRSLVMFRAYFRCELD ELEE
EWVEEVTRDLP

<SEQ ID No.:0013;PRT;Methanopyrus kandleri>

50 MVEINKVAILGAGCWRTHAATGITTFKRACEVADETGIKEAAL THSSVTYAVELKHLA
GVDEVVLSDPVFDADGFTVVDIEEDCDVDLDEFIKAHLEGNPEDVM PKLRDYVNDIA
DDVPKPPKGAIHFLSPEEMEDKLDIVTTDDAEAVEDADMIISWLPKGGVQPDIFKKII
DDIPEGCIVANTCTIPTRQFKEMFEDMGRDDLQVTSYHPATVPEHKGQVFVAEGYA

DEEVVEAVYELGEKARGLAFKVPGYLLGPVCDMASAVTAIVYAGLLTFRDACTDILG
APVDFTQNMAVEALQMMAKFMEEEGLDKLEELDPAALTNTADSMNFGPLADTEIL
PKALEVLEKYSKKA

5 <SEQ ID No.:0014;PRT;Methanopyrus kandleri>
LKEPEPGITDLTETVRSRPFWDVVKEIGLAKAEIEAEVVPEGSRILVLGAYLTGIFVAE
LLSEEHEITVLDPEPALRKILPPGVRFRASRVPPPGRYDVVIDLTGLGGTNPRVLRRL
NPEVLVVENPAGNMNDPRIEEYNDTEERLEAGEESYELRLFDAPFEAKTSGTFTLS
VRTVREAANRLERHYGVLYAVPGVVNLERWTFRLRRPEEGVERAREKPAVTVSQL
10 TGSSDPDEVIGEVLDEILFEIRER

<SEQ ID No.:0015;PRT;Methanopyrus kandleri>
MRSSSSKSVSVEGVLEVLEGLAPFDLAVEGDEVGLVAGDPSDSVDRVVVCLDLTPQL
VRRLSPETLVISHHPVPGPLLERVRSPVIVFHSNWDAAARAAEALAEWLGLDVRKP
15 DPLAAEGRFDGTLEDLLSRVEDALNPPEIRVVATKNRIHRVIVVSGFGLSTDRFVRLA
AKEGADAVVSGDLTHRTAVVARVLGVTCVDATHARTELPGLKELAEELSKRLRVV
ELRSPEHPVGDHYRAFQRRARSQDGS

<SEQ ID No.:0016;PRT;Methanopyrus kandleri>
20 VRFKDALREVRTDRKLADTEAIVRLLSAKSVRVHDLFRAALSEKLHHRGELVKLTSTI
HVTNECIRIRPRCAYCGFAAGASPEGYFEGFTRSYEEIAEAAKAIEESGIPRVSCSGA
YRGDGGKLAVTAARAVKENTDLELLINFGHDLSEETIAELARLDVETICCNLETTNRE
LFERLKPGDSFEERVRCETVCRYGIDLSSGLLVGIGEDYRDRAEHLKFLARFETLA
EIPIMGFNPYPGTLMEHVPRCPLLEQAKVMAVARLMYPDLMITAPTPTVGPEEVEVA
25 LMAGADNLATVIPDNHPHEVKGVGNPRTGNLDRVVELIEGFGLKPELRGDRACSTS
CTKLVNRSTQRSS

<SEQ ID No.:0017;PRT;Methanopyrus kandleri>
LLDLLHEACESLDAALELKRLAYEGKLSVDEVVTDLGELTDRELEALGDNLRTPFMG
30 CDLIELAVGPCASDYSPPDVLLANAILADRMGLPLHVCAYAVADVAENYGMRIELFR
RLVRNVVRVPVDVDHIGAHGPMRFPDITACEGTCYLEGPPFKECPRGRIHRRLIDKE
RQQGEDLEEWAEALAASICVNVTEGEGQDAEHAAPLDEMKRVAETARHSGAGVG
AILHVADGEDEFADGLKAAVEEVKADYLAVEGGPFNRAEDRLSAFRRAVVACRVFA
PGKVLTNGAYEDELVGLRAGLNGALSGFPKNHHGYMVGYPGTARRGKFGLPK
35 VLAIMRKTLGSRYGNTKVPAGWEELEGITRAALFLGSNLLYPRDVAGIPIGDVHWVA
ALRSNAARELSDEVRSVEEVASEVDADTVALLGGRFPWGLALTDELGVSEVLISD
PDAWVERATVRLLDEELDATVHAMAGDDRKAVKEADAAFTAVMPGIAERLAERT
GAMTV

40 <SEQ ID No.:0018;PRT;Methanopyrus kandleri>
VLKETLLKAWWESWEGTRRGDEEREVEGLREYLTSADRLAVVTGNEDKLRAVNKV
LRRFGLPEAMIRVPTMADATPCPAIFKAIMGVQVSDADVVIARGRLGVPGSGAM
TVFMDARCRLTAALSPPHVLHEMSVKEAMEREAEALRRLGMRETTSR

45 <SEQ ID No.:0019;PRT;Methanopyrus kandleri>
VFSVPSPGDPALTDRLRLSLPTDRIETVYFGLPIAGTGRATPVQVDTDTATELAEVC
HSYSVEPEAVINPLCTADVCSRNAFAEFERTLDDLDDAGIERLVLSPLMIHAAVE
RGFRVSVSCVVEVNTPERARYFDEIGVEEITLDTNVNRRLDITIEAIASEVSARLRIIVN
EGCLPDCPYRASHFCLFSHATRPGEVAEDPYFVRCISERVNNPTLIKSPFVRPED
50 LSVYMDLGVRFAFKIAGRANSITWIRRAVRAYLRGRYDGNLLDILDCTVLRHLYHVD
NRELDGFLKRVGRCDRRCSKCGFCAELAEAVEPLGGLEDAEVEPARTGRVTA

- <SEQ ID No.:0020;PRT;Methanopyrus kandleri>
MPKLNQRGLVELRRELERRLVELLGKPVHVMQLTIFALPCGCVGASLEVRNIVREDA
EVFRDHLRDLLREMVKWTLGKEPDLYYARLTPSGYDVVSLTGRVACDECEKNFKG
AADVLPL
- 5 <SEQ ID No.:0021;PRT;Methanopyrus kandleri>
MTEVGVIGGTGFQPGLPERRRTVFTPYGTVRVDITRVGDHRVYFINRHGKGHDLP
HRINYRAIWAMRELGVKRILATNSVGVINSDEYEPGDIVLPVDFLDFTKRRPTTFYD
EKVVHVDVTEPYCPELREALLKAADDLGTVKEGAVYVATEGPRFETPAEIRAFRKL
10 GGDIVGMTGFPEVVLARELEICYASVCLCTNYAAGIDRRRTIDEVFELVEELRPKAV
ELIERCIEYIPPKRSCPCSQALEGAEV
- <SEQ ID No.:0022;PRT;Methanopyrus kandleri>
VFSISVVITIGGLPGSGTTTTMARRLAEHYGLKHVYAGKIFREMAEERGMDLEEFKSV
15 AEDNPIDLEIDRRQREAAEEGDVILEGRLA AFVAAGELDHVKGPDLATLKIWLKAPL
EVRAERVAKREGIDVEEARRIQEREKSELKRYKEIYGVDPTDLSLYDLVLDTSRWS
EDETFSILKAAIDPLLEREDP
- <SEQ ID No.:0023;PRT;Methanopyrus kandleri>
20 MPAPRYRSRSCRRVYKRTPGGRTVIHFEEKIPNWPCKGACGRRLNGVMRGRNVE
LKNAPKTQKRPNRPYGGVLCPECARKLIKDKVRYKFWERKREQPWLPLPDEEPP
EPEE
- <SEQ ID No.:0024;PRT;Methanopyrus kandleri>
25 VHGLTEGLARHFYPLVDPFIHYFGPALGMLVAAALVTLFIDIVYELVIGREELERV
MADETKKYQEELQRAKVLGDVKRMKEIEEKMRDHSREFLKVQSQLMSKQIKAMIITF
PPIIIITYLEYRLAHWTVKLPFYVPGVGD TLGPVGWYILCAVTVSFVLKPLAETAVKRF
GGG
- <SEQ ID No.:0025;PRT;Methanopyrus kandleri>
30 MGYVIVATGVPVGATTVTTEAVKELEGYEHVNYGDVMLEIAKEEGLVEHRDEIRKL
PAEKQREIQRLAARRIAKMAEEKEGIIVDTHCTIKTPAGYLPGLPIWVLEELQPDVIVLI
EADPDEIMMRVKDSEERQRDYDRAHEIEEHQKMNRMAMAYAALTGATVKIENH
DDRLEEAVREFVETVRSL
- 35 <SEQ ID No.:0026;PRT;Methanopyrus kandleri>
LADDWLERLRPILERLPEVKVPDRHVPFNEKLFKYTGIPILIFYFILCEIPLYGLSPQAV
DYFANLRAVLAGNFGSILTLGIGPIVTASILLQLLVGGDLIKDLTNPEDRRLFQGLQK
LLAIVLCFFEGVMMVFSGAAPPAEPSILLEILLILQLALGGILVIFLDEVVSKWGIGSGV
40 GLFIVAGVSSQIIIGAFNPLPSPQQPGRPAGAVWAFLYSAMQGTDPDWTLAPVIGAI
TFLIVLYVEGMRVEIPAFAGIRGARGRFPVRLLYTSNIPVILASALFMNVRLWALAFQ
RMGVPILGKLDPRGQPISGLVYYLSPNSIVKTLSDPLQALGYMMAMVIASVFFAVL
WVELTGMGPRIARHLHRAGLHIPGFRRDIRVLEKRLQKYIYPVTVMGGAFVGFLLA
GADLMGALGGGTGVLLTVSILYNMYEEIKQERLMEHPVVRKFLEKTLR
- 45 <SEQ ID No.:0027;PRT;Methanopyrus kandleri>
VVVRRKKKSPKKYRGSRTTHGGGSHKNRRGAGNRGGRGMAGSHKHKWFHVIKYM
PDHFGKRGFNRPPKVREPNNTINVGELDALADKLLLEDGIAEKDGDKIVIDVTDERLK
PYGGPFDKVLGGGHVKRPLVVVAPEFTERAVEKLEEAGGEAREA
- 50 <SEQ ID No.:0028;PRT;Methanopyrus kandleri>

VRGPVGVRRDIEDTMRMLKLLRRNWCVLIDDRPSYLGMLQKIKDYVTWGEVEPDT
VAALLKKRGELEGGRPVTDEYVSEHTEYDSVEEFARAYCEFEALDDIPKLKPPFRL
HPPRGGYERGGIKPYTLGGALGYRGKAINDLLERMI

5 <SEQ ID No.:0029;PRT;Methanopyrus kandleri>
MSVPPHLEEWEPKTKLGRMVKEGEIKTIDEVFAQGWKILEPEIVDWLLPDLEEEVLD
VNMVQKMHKSGRRVRFRVTVVGNKDGFGVGVGQKAREVGPAIRAAIDRAKLNIIK
VRRGCGSWECGCGRPHSIPFEITGKCGSVRITLKPAPRGTGLVAGETAQKVLEMA
GIEDVWTKTTGGKGKGETRTTINFAKATFDALRNLIYVRMREEEAERLGIVSGSAEG
10 A

<SEQ ID No.:0030;PRT;Methanopyrus kandleri>
VIALATGPRYRVPFRRRREGKTNYYKRRELKADAPRLVARKTLNHNIAQIVDFAPH
GDVTLASAHSIELRNKFGWKHCGNTPAAYLTGYLCGLRALERGIERAVIDIGLHRP
15 VRGSRVFAMLKALDAGMDIPHGEEVLPEDRIRGEHIANLARQIKEEDPEEYERRF
SKYLERGLKPEELPEHFEEVKSKEIEEFGGA

<SEQ ID No.:0031;PRT;Methanopyrus kandleri>
MNLRPQRRMAAEILKCGVHRIWIDPERLEEVARAQTREDIRRLIKEGAIRKKPIKGQS
20 RVRARKRHEQRKKGRQGRGPRRKGAKGARMPKKRAWIQIRPIRRKLRELDRSG
KIDRSTYRKLYMMAKGGYFRDTSHELLAYIEENDLWKK

<SEQ ID No.:0032;PRT;Methanopyrus kandleri>
MKYKMELSDLECPVCGEKALMVHGRVDEIPHFGRVLEQFIHCKACGYRHSDVMCL
25 EDREPAEYRYRVNSPEDLRVRVVRSPSGFVEIPELGIEVKPGPAAQGFVSNIEGLLR
RIRERVETAAKWADKEESKKRAEEILRRMDAAVSGEDEITIVLKDPYGHSAIVPEED
DKLEVRELDEEEAEELRSRIFRPLVPSGEYSN

<SEQ ID No.:0033;PRT;Methanopyrus kandleri>
30 MARSTIVLIGGASGVGTSTIAREVARRLNITHLIETDHLREVLRGAIKKYAPVLHMSS
YNAYRALRIPDH MVPKRFRDRVIAGFVEHASVMKPAIDMVIKRAVEDASDLVIEGVH
LVPGLVRPEDYQYADVHMVILYADEEEHRRERFVKRAMEKGRGGRHLEYFRQIRIHH
DFLLEAADEHGIPTIKNDIDRTVSEVLSVVRVSVVIKSVHSLEDSVREAEIIRENNC
RLIDIGFPIPGKRDVIKVSFRRDPVDEWEEILNNEESRQYFKHLYSASNNVHYHKISA
35 PDEESLHRAIEKLREEGFKVEELRPGDVCEVGKEDRGG

<SEQ ID No.:0034;PRT;Methanopyrus kandleri>
MLGFLKKIFGEGENSKGPMLEDFLEEEEEERTQHVKVTIIVSRVQEPSDLEELMNEL
40 YQGNVLILDVKPLLD RDGHEDIQELKRTAVSLGGFVGVIKDTVLLVTSDSVDIERRG

<SEQ ID No.:0035;PRT;Methanopyrus kandleri>
LTVLRSIDELAE LNPFVAVVGAGGGGGEKFATLPTVEVVGIMDDDP SKVGMEIAGVKVT
NDFDEAVEGASSVAIMLPKGAEHRALELAVESIRRG LNVVTSFRSLPLEDYPALVKL
AESKGVKILELSPRLDVREVAGDAPERCTEVVPKDRPETEIPRVFVGGTSQECG
45 KRTTTLKLAEGLEASGYTPATVATGEFAALEADVGFAGSLSVMDVASAVAHAVDY
VAEEKDADVIIIEGQSSLTERRNPHRPLYLGILLGCAPDAVVVCHRPNHFPFRYPRG
VLAEVNALRVIVPDADLA AVCVNPRNLEEPFETYARRLR AKIWRATGEQVPVRNPV
EESEKLARDVLR TIEGAGRGGARC

50 <SEQ ID No.:0036;PRT;Methanopyrus kandleri>
MKETS VKVEPELDSRAFRIAVLGPENAGKSTLVNALMGREVTEVSEVPGTTKTVSG
YRWTSREFPLYVFDTVGLADERGKRSKRGVRAEDVAEKLGRYDLALFVVDVTRHV

GPETLRALHVIKYAADLETLLVANKIDLLDRGELEERLERIRERTGHRPIPVSA LTGEG
IGRLLREIERRVREKRRTLRAAPGYR

- <SEQ ID No.:0037;PRT;Methanopyrus kandleri>
5 LDVEAVYRLKRILRTGWLVRGIPRSSVESVAEHSFGAAMLAWEICHRLAERGIDVDP
YKTVVMALIHDLPEALTLDLDVEASRVFGDAKREAEKAAECVFDEELDLWREFER
RESPEAKAAKLADTLDMALQALEYSQVGFEAYREFLDSAEREARELGREYLLVFKEI
LRERGWDSNEG GKGSG
- <SEQ ID No.:0038;PRT;Methanopyrus kandleri>
10 MKVVEKDLDKGYIEVLPETLDDLWHLYHVVRKGD LVFALERRRVKDERAETIRRDK
GERKPVYLGVRVEDVEFDKYANRLRIKGVIEHGPESGSHHTVNVTTGKRIKIVKDEW
ERKDLERIEEAEMS RPPVMLVAVD TGEGTIGIVRDYGLDVVARVRHNVP GKRG GDR
RAEMRKFFHRLADEIERIAEEEGVEHIVVGGPGFVKSDFAEFLREERDIPAHVEDTG
15 SAGEAGLIEMIRRGAVERA VEESRVAEEVKHLEEVFKRIGKGDDKVAYGVRECLKA
AEFGAIDVLLVADEK FREAMVEGEEDVLNAVKYAERTGAEVLIVSTEHEWGERLREL
GGIAALLRFSIPTG
- <SEQ ID No.:0039;PRT;Methanopyrus kandleri>
20 MAVERVSTGIPGMDEV LNGGIPERNAVLLTGGPGTGKTIFSQQFIWAGLEEGEPGV
FVTLEEHPVQVRKNVEGFGWNFREYEEEGLLAVDAFTGGIGRASEYEKYVVKDPT
DASELIGVIRQAVNDVEAKRVAIDSVTPLYIDKPSVARRIMFRLKRMLAGLGCT SILVN
QIAAHERGFGGPGVEHAVDGIIRLDLDEVEGRLWRS LIVWKMRGTAHSMRRHPFEI
TDEGIRVDPEKV FVKERGEVREVED
- <SEQ ID No.:0040;PRT;Methanopyrus kandleri>
25 LGGLCPRCRGRGWCGRDRCPFLDALNEVRARLSSRNVDGYTVTAHVSWRGYPRV
IAAPGVGEHRT PDEGGVLADLPYEEALKTRALTFRYRGKR DVRNPPDLSDPEIES
SISVRPVESTLQVRRRLSGASRTTFFIGPLVEGELELDGTPKVPRDLERYHEDDVKA
30 EEAVVGLYRRGYDESYIARALSLGLGRDRMVPTRWSVAAVDSMVSEHLAREVR
DLPVSSEYRVLSGEVFGNEMWVILRPEPLSYELVEAYEPGAPWSDRTRIAVL RDSE
VKDCKEPRETG GAYFAARLA ALEWCSELGKQHGITVIRIVRKEYSAPLGAWVIREAV
RRAEEVFSTDDPREVWEFLREKLD DPVG EAALKVIKRG RQRTLDTFL
- <SEQ ID No.:0041;PRT;Methanopyrus kandleri>
35 MLLLKDHA EVLLTVEELGTREEAREIAEEAEAVTEIIPQRLLLELELQGLMKRVGPNEW
ELTDAGKTAAKAVAEAVDILEQPPQEW AHDRWVGSDTVLALKHAALS FVPERWEE
LLSERGLSEDGELTKAGELVLEAYFKATPKLYVTQDVAGRIARLP PGPGTLKTFIRYR
ETIDIPDNIFHALEAMRLLVISPPADGGRTYTLTALGREVKYAIEKAIPAMHLVLSPGIM
40 EDVKAVSEGE EEPEDMERLERLGYAWKGS LTRAGEHVL RAYEMVGEDFPGVPPISI
RPSELRLLEIIDHLYRPDENPNVAPTLKRIKRVLVEEYGEADPDPTTDLKELEAHGFV
EKTVC DYGKEKGKPIWVLTEEGERLLHGLGAPVRAEGVKAVTVSMGFESPSPEWL
EEAHRAGLV SQAAITTKGLMAAKIARRVERAPFLT GDEAKLIYRMPNGSIDRGKLIED
VCDRYGLEEHQVLESLSKLESRGIVEELLTGGVILTRAGQHLKTAIHRGQTMEILKLR
45 HPITPVATRLLKAVYDLKREGVS AKKLSKFPKTL LKRA DVTLDQAKKAVG LLRRTKM
MSGWKITEAGEELLRAFEVLQEAP EVRQHPEEAA
- <SEQ ID No.:0042;PRT;Methanopyrus kandleri>
50 MRALALLALVLA AVGGAAAE EAPLYGVLTHPWTFQLSANQAKQIPKEYVISVEAPAG
AQLPLGKAYYG VVADGNHAALIVDLTPAVTGETDDAVVDPN AMSGKLPPAVKFR
QWKPAHLAKGALLALSLET KPLPVGLSLKMVAPEELTIEVGKFQV KLNRELLEGLAR
VLATHEYGH PHGKKKTPVGYLQALVFKYFVKASVTGAEPEELQKLEVSEEEKEGEE

EKEVDEETGYALRAFLEVNEQQGLTDLKAEFSVDNLENLIGEAVTVLQDVLSSPEAQ
QAAATAESALKKFVQVPVAAVCLLGIALVAVRRR

<SEQ ID No.:0043;PRT;Methanopyrus kandleri>

5 VKVSEIVSMLARILAEHYRSGVSLKESFYRALDNPFSIPSHRARAIHRRMLMELGKRLG
LCEEILDDVIQSGSFEDLGPELKGVLVTAADMLFEGTSPALVTDAAATRVAKELVSD
RVADVFHAVCFDLEKYDVDRLKRRGYDDLCLRHYPDFVDYVRRVLPEDIEIDFL
RACNKPAVKYVRVNTLRADVDEVRERLAEEGVLTEPDEHIPDLLRVVEEIIPIVRTEA
WKEGLVFTQDKASAAVAHVLDPQPGFVVDLCAAPGGKTLHALCLMEGEGEILAVD
10 KSDWRLDAMREKLAWQRPVDPGVVLRCADAREIPEELDEEADRAIVDPPCSGMGS
VQKRPETRWNVTKKRVRRYAKLQSELLEAAIKTVRPGGIVVYSTCTLNINENENVIR
RVARRYDVTIEKVNLQFGRRLVPGTRRFYPHTDRCQGFFIAKLKRN

<SEQ ID No.:0044;PRT;Methanopyrus kandleri>

15 LYEDGEKFAAFGAYYRREKGCKVMKAAVDAGFVCPNKDGRISREGCLFCPKMGRT
IITPNVDPRKKLEEQARKQMEVFRERYGAEKFLVYFYPATNTYAPPDVLEELYNRAL
EMEDVVGLSIGTRPDCLPDEVLDILEGYVKEGYDWWLEIGVQSYHHRTLRRTRRGH
GLAEVIDAITRAKERGIRIVNHIIFGLPGETRDEMLETVRVLSVLGVEAVKLYPLVVLE
RTDLERMYDDRRYKPLSYREYIRLLADALERMAPTCLIQLSKDRAPDEERIEPEWD
20 LYRMRVISDVRKELARRESRQGELYKVGLSAEELVPLVKGATGAERSGVST

<SEQ ID No.:0045;PRT;Methanopyrus kandleri>

MPPKWYRHVMRVLSESHVVLEVRDVRYPEETRWKLPRLLEDVDFTRVWVLNKAD
LVPRAETERVKEEVELEEDVPAVYVSARERMGFRHLRRTIYEVAPEDVETVRVG
25 GFQNVGKSTIINALTRRSAAETSRRAGYTRGKQWVRGGRKLLVIDSPGVIPTDEAAA
EVALDPDVLDPVEPALGVIERVVREYPGALSDKFGIDESMDPERILRDISERLGKD
LRTTAKLLLREWVDGSLVEIYRTTRADLAETSELEVGGTAQRLVEETLREIEEVPE
GIPPSAATVRGILTRLAHGENVDGVGFGTIRLGEYGVGVSVGDRYYDRMVRLRRE
30 LGGEVISEERFRVGANGRKAVALVTKGR

<SEQ ID No.:0046;PRT;Methanopyrus kandleri>

LIALVKSVEEYRRLLEGEVVEEGDVVVELGCHRGAAATRIILTGSPPRRVAVDYGKDAE
EAMRELERSHPELTFVKGDAREYDTLKRVLLEELGGPECDVLAVDLGGGMFPDTAF
KVVYVWSVTLRPRDAVVRNAGLCEFLKLAELREEVHLDDENRGYLGELSPPGIPGR
35 IRERFEEFKLWRG

<SEQ ID No.:0047;PRT;Methanopyrus kandleri>

VFGRLVIPGGCRKVLVRVWGGRVKDLRNCKLCAWECGVDRLEGERGVCRVTEPVI
AAKQLHPAPPASYTVFMAGCNYRCLNCQNWDIAHYPDNPEGRALGYQDPKELAVE
40 AVNMIETNQGRMIGADRIFFSGGEPTIHLPIEQVVEHYRDTTDLWKVNFDTNFAT
RKSMRRIVKLADSITFDKAYSDDLHRAITGARVEPVLRLNLEFLIPKYLDKIWEVRILLI
PKAHDTEEIRAMCEFLADLDESVPVCFLAFRPNFVLERHPGAPKRLMERAVEIAREC
GLHATWSGMPGINGSVPPEVGECADKLLKHYDGRKGAALMGYARVTGCRNHPR
45 DCLACDDMARCPIKRYVAIRRT

<SEQ ID No.:0048;PRT;Methanopyrus kandleri>

LHWEGEKRRRLKELERAIERGEVDEAAIPVLETLNSFEEYCTTSSCSGRVWVLHEPE
VGDKIGSEFVAKWHEPPEPEEVRVAVLKAPEEGITWVKAQPPLFHVCMCRDLEAAVR
LRNIASEAGFKASSIRSVKSSKVIVEILGGERMDVPAKVNGLTLTREKAWDSVALC
50 NDILRSGHERLSRLVEALKGLSR

<SEQ ID No.:0049;PRT;Methanopyrus kandleri>

MVLKRAADMVPGFRDLVEPILDDCADLEELADRVVETEMEPDEVRRRDVGNTDS
NEPVAIFGSSCVLCGGDCSSVRLTSRIGICERCLPVDLTETLREVLKEARKRHGYVGE
ALLMFILVERYSPDRVEEFFRRYVWPELFTIVDRVFDRTATGFRLYSAQRVWTRRLV
KGCSFSILAPTGTGKTSWGSVAAVFGHAGRRVYLVPTTTLVRQVENRIKGFARD
5 AELDVDVVAYHAAMPTQAKREALERISSGDFDVLITTAQFLVHRVEDLEKLNFDLILV
DDVDAIIRGTGRNVDRVLRVAGLEQEEIDSAYRLATLRRRYSLRDWLRSLDRGD
KRAERVREELREVEREIEELELLKRVKKERDLARIVFMSATGAAAPSRRLAVVREL
FDFEVGAGGEGLRNIQDIAVISEPSPEAVERIVRKAGVKGGIFVPQRLPGEKKAREI
VEELAHLRSSGIEARAIHAGTPAEEREEAIDGFSEGDVDVLVAVASPYGVIVRGLDL
10 PQAARYAVFYGVPRQIRLTPREEDLKDPTYVASALSNLARLLDDRRARSRLGVA
GRLWRIIRGTWIRERLEEAVEPLSLNTLMKLAKRDPEDIAEQLDVDRWLARHVQTL
AEGVRELTRLLGDPDRVKALAEAEATTVAVYEEGEEAYLEVPDLRTYIQASGRVSRIF
AGGVTFGLSFVLCPEDERELRTLNLIRMSYTYGSEFEWRSYPKSLDMKEIGLEL
KEISDEELEELVRKVDEDRERVRKVLGELKPEETGRLARSALMIVESPNKARMIAS
15 LFSQRPSRRRLNNGGVAYEAAADGLHLLTVATQGHVADLVEEPGVHGVLRIDERWV
PMYDVLGRCSECGEQVVGSEECPNCGGEVELKTPLESIRELASEADVILIGTDPDT
EGEKIGWDVFNLYLWTTAQVYRTEFHEVTRRGISEALKEESWKNVDAGRVSAILR
RVADRWIGFSLSQDLWDVFKHLEIKLGELPSGSRIEVRDIPSGVEVVDFFRTFDED
SSVRSRSVRLRREGDEYVVRTRISRGGDVITYATLLDPNRKLGDRNGVRPELVVRV
20 RASVNGEPVDPNVKLEPMTWLSAGRVQTPVLGWIIDRAREYRETEFYACRAEVA
DDVTIRALIEELKVPRALTEKLDEATIRVLSKIAEEGPDAAFSEEEVGRFTETELFERK
DGRYRLSEEGRKVLESEGVIGLMLHLAGVSGR

<SEQ ID No.:0050;PRT;Methanopyrus kandleri>
25 VIRAIATVDENASYIAFVETPSANEKLLDVMMSREKWRELGMFVLDDHHGQLSEEPSAV
AQAYEIVKEHTEFPLVRKVVEPPVDADMVAAVLLLKQGPVLPEEDVEVLDKIDRFKG
HYPSEEELESAEYALAIMQAVAEEVVKKPYDPNPEELKETFKKALRTVERVVDDEKY
REKLASKWLEEFKRKSVREAEESTEVEIEEGEVEVGNDRIRWCAAISEAQNAFTYLYRE
GYDLVVLVSPVMKRVTVGLADPELPIDLRELFEYLNHHREGWGRKNIGGSPKNY
30 EIDEEEFKDIVSFIHEWLLRFS

<SEQ ID No.:0051;PRT;Methanopyrus kandleri>
LDVEEILRDVGVDPRYVAILDDTVVALNPRRAGLTVSRREELRREGIKVVRSKVVER
ASSRFHQVTDYDLFEPREEVVVGFSGGKDSVTCLLMLEPLTRRLGLRIRPVLVETR
35 LHGDPIWGREGREVCEEICRSLGFQLEYVEPREVDGELAEHGESPCLICSLIRRE
LRERGDKLVLHTLDDAIVTAMASAIKGEGLNLRPVEELGGMRSEYVDYDFPETTIV
RPMIRVPEVWTRLIPGEVGLPIFESDCPYSKPYGTTLRGKVAHGLEWLRLEVGADES
VEFLDRLYRSFMKTLEATRG

<SEQ ID No.:0052;PRT;Methanopyrus kandleri>
40 MSLTMLMFLNLVLAIVLSVGPDGIIIRPDVLYSYGLYLHNITVHPECLITYMFLHANLIH
LLFNMLGLLTFGVQLERVLSTSEFLVLYLLSGLMGGLAQATLTPDVPVVGASAAIFGL
LGCLTMLRPMMSMMMLFIPMPLALFAVLYAALALFVIQSGVVTQVAHAGHLVGMIVG
GVLALLYRPSEALKGLLAVAAITALLAGYWFLTHP

<SEQ ID No.:0053;PRT;Methanopyrus kandleri>
MAAESIAKAVHDVLATWGAQGPGAIFFLVWAAVLVVGMLGFMFLEAGQVVRTKNV
VSVLMKNLLDLSLGGIVFIFFGFALAFPDYAQSIGKWIATMFTANPWSADPMKAADP
YNLAYCFFQFAFCATAATIVSGAVAERINFKACLVMTVLITGLLYPIFVLWTWGGGW
50 MGGDTGLFAKVFGQPYHDFAGSTVVAHIGGFLAMAAAYLLGPRIGRFKNGKPVPIPI
GHNIPQAFLGALFLAITWYGFNVGSSAVLYDPTNESWISSLVATLAMCGGAAAAAFT
TRFDPLWAANGLIAGLVAICAGCDIMSPFGALLTGIVAGLIIPAFRLLEKLEIDDVAA

CPVHGFAGVWGAIAAGIFGAEALGGAGGVSLAAQIVGALVCIAWALGSGFATFYVID
KVIGLRATEEEEEKGLDETEFGVSAYPYMETRD

<SEQ ID No.:0054;PRT;Methanopyrus kandleri>

5 MYMIEAVIRPEKLDDVKEALDEAGYPGMTVIHVKGGRGRQRGIVHRYRDEEYRTDLL
DKILLKVAVPTEDDVKEVIDVICEHAKTGRPGDGMIFVIPLEDAVRARTGERGDDALS
TEE

<SEQ ID No.:0055;PRT;Methanopyrus kandleri>

10 LLHADVLKVLKQGYGLVGKHSAPKCHWCREAIKNGRHCHYKAKFYGVESHRCLO
MTPTVAWCQQRCVYCWRPVELTVGTHDVPDPPDPLIVEESVEQQRFLQGYGH
LEGARKRWKESLEPRHAAISLAGEPTLYPRIGELIDAFHSHGFDTTFLVTNGLRPD
RVEELEREPTQLYVSLDSPNEELHRQINRPTIPDSWDRIMRTLELLNSLSCRTVIRIT
15 AIKGWNMEGTAEFFGELLADVEPDYVEVKAFMCGWAAFRMSPDNMPSHEEVRK
FAAEIAEHAGFELVDESPPSRVALLSS

<SEQ ID No.:0056;PRT;Methanopyrus kandleri>

20 MPKRAGRVTIGLYNSYDPRRFHEIHARTIARAAPLCVAFDFKLALFGFPLDDLGVET
PHELAEYVAEETTIGASGREVLVLAERNLLEVYDYPVRGFPPQLGTIVGTTCPDER
KAIEPEDVVREILRPRSVTLVFGLGRRGLPAEVLEACEYHLDITGRRISLETATAIGAV
TAVIGHLIKELGE

<SEQ ID No.:0057;PRT;Methanopyrus kandleri>

25 LKLREVKPEIRVLGIDGYYGPEDDRALVGVVMRGGQWIDGVMSTEVTVDGLDVT
DRIAEMVNRSKHRPQLRVILTDGITFAGFNVLDIKKLHEETGLPVISVIKRRPDVASV
SALSNDLTEERRKIVLRAGPVHSHVKTRRDEPPVYFQCAGVEPDVARVVLKRTATR
HRLPEPIRVAHFIATGVTKGESSDA

<SEQ ID No.:0058;PRT;Methanopyrus kandleri>

30 VKLPEVEVVVKYDKDEVLLLELPGEDHTLCNLLRWALNRQDGIATYRIEHPILGKEH
KVDEERYVPPKMRIRAVDEDADAREALERAIEELLEVEEAKEEFSGALEEKES

<SEQ ID No.:0059;PRT;Methanopyrus kandleri>

35 MPKMEKREITFTFPDRDSAQRFLRAVEATQARGVDTVVELRGTRVKVKVFGPHAAV
KAHIRKLGELRRTVLSESEEEKQVRLHLSTICREAGAPKIPSELLRDALRRRGYRVR
VRGPWITTNAPMSELREFVRELAEAYREARFYAASEPVRRMLAILSHEYDVPMDL
AYEAIERGVLREGEDGRCELREDPKSTERKLEEIASELRKARKGRGKTLEDLHEPL

<SEQ ID No.:0060;PRT;Methanopyrus kandleri>

40 VRRYVEPGKFVLP GDKITVAEAFYPGPGTYEDGGVVRAAITGRVEVDLEEREVRVE
PYVDTPPKLKRGASVIGRVQSVKEQVVLVKICFVDDRTDREPPTSGVGGIHISKVRD
AYVEDLADEFQPGDIVRARVSTKMPVQLSTVGKEYGVVLAYCTRCRSELEKVKGR
TLRCPVCGHTETRKVAAGYLREAESDA

<SEQ ID No.:0061;PRT;Methanopyrus kandleri>

45 LDPTKEVRNALVPHLKKLKDERVAVISDIDVDGLASAAILGHVLNNVGADFVLYFSPP
ANFEEVVSIGIAPECDVLIAADLGSTGETAIHDAKSEGCRVIVVDHHQVLEDVRPDVFI
HDTRLCAAELCYWATVDLHERDLRLIAAYAAFTDYAEEYSRVLRETLMYDRRKVY
TEASLLDYALIRMDGEDRRELALKLPETPVSELDEVYELARDAMAEHEVLRREAREV
50 AECLNEVVAYAIMDDVHPAMTGRVASHVAGVKRRPVGVCVRRGKISARVVEGEEID
VARAIRKAATEVGGKGGGHAPAAGGVVPESRVEEFLRLFGEVVKRQVESARTRKS

- <SEQ ID No.:0062;PRT;Methanopyrus kandleri>
LIDRR LAMELDGLEGFPEPKLSLEQYETPGEIVRVLLSIADREFGLECSRVLDLGAGT
GRIGIGAALAGACEVTCVEVDSKAVEVARNVKRAVEDRVEVVEADVDFEPED
QYDVTIMNPPFGAQRRGADRPFVEVALEASSGVVSLHRAGTEEFWKRRARELGAT
5 CDAIGVVRFPPIAMYPHHRSRIRHVDVAVLVFKKVD
- <SEQ ID No.:0063;PRT;Methanopyrus kandleri>
MMLPEHIICASCGRVGRKRTPPECPCYCGEKKFVRMDPEERLGKGPEWWKEAER
ERRVRERL
10
- <SEQ ID No.:0064;PRT;Methanopyrus kandleri>
MPAGPVHLVYGVLLAVTSYPQNPEYGGMIVYASLAPDFATAAYNDRYSDLRYVDYR
WAHDPHTHYDYASVIVERTTSRTLQGVDEKVALWCAETGIASHLLLDLYTHVKTSPI
KEWREQAGIRTVLQEFYYPWQENAVEFARWALGRAIRVFGNPDEFWRYVDGACA
15 VAEQLMGDYVISAYLRRLSERYFGDPDLHLADWLRFYRNYGWEENATDAFIIDGV
RIPADPVELLWSISQWDPRVPMRPPQSGGGGSLLLVPFVPPVRRR
- <SEQ ID No.:0065;PRT;Methanopyrus kandleri>
LPRYLRRRRRRRFLDGGDNDDPLTGVANLFDAAMVFALAFITMSSSYGLTKILSP
20 KTSEATIITKTTTGKVTVTKIYRTPSGLKVEQFKEVARAKRGGAGLGHMKKLGGAVY
KAGKKYIWVPG
- <SEQ ID No.:0066;PRT;Methanopyrus kandleri>
MVSIAITQALYVVMELLYPTIVLLLLFLAYSLMELAIFLREVAYRPRFTRKDLEQIA
25 DKFPDVKRLPPHFSEFLRRVEKIVEKSDSADEASLKVEKELENLENFLASKVSRTRIV
VRLGPMLGLMGTLIPLGPGLEQLAKGNIAGLATSLITAFATTVGLASAGACYVITLF
RSRWYRKDVSDLEFLAETILQREFGG
- <SEQ ID No.:0067;PRT;Methanopyrus kandleri>
VFHGVIAAFTTYLGASAAALMLRYHSGVSEALTYGAVYGMAAAIGVGTGVMLTRV
30 LGARKKRREVIRTVLEGTALSGVALLVGLLDVTAGAI AASSVALVPSYRISRD LGVS
PFKIVTLLAVTSSVIVAALTSMIVPAFADNPYALAI AFFFVIVGLKTGLGIGFAGFQL
RRGAMVIAALSGILIPAIIGLSHLVSKFMKTALAMQRYALLGHALLGLFLIGLIFIARK
WAVEGSAKDLSKLGAFFVAVPCICLTGVALSIAMYAEIGALNVTQAALVLWTCFVS
35 TAYATLIVADAVIEVLKVPAVALSGLENLVGLLFFVITGIIAWAYPLWKRAKPKLALPS
PSKIGPWALLFLALMAFGYLWAVRKASRGNYPPDNPIDDIIRAVIEWLASRRR
- <SEQ ID No.:0068;PRT;Methanopyrus kandleri>
LRWKVTAALVATLVISPALVHGSFDRHFQKYLRMERLQSAVSDIDGATKDVATVLAS
40 SPYLAYKAALYDNTLRVGNDPGRDRLELLSAIRSAEHKLELARLKIRKARAKGVTGL
DRAERNVSRALSALHRAEDRVEKRAPGVTDLDREIDALTPVLRTLTERKRWLVQEIT
SKLPKFKYYELSENLLYLPPFNILFPLVGAFGP
- <SEQ ID No.:0069;PRT;Methanopyrus kandleri>
45 VSRIGEIVTEMFQDGRLFLGMGEYAQTVAYDELLLWFDVLFDDDEHILDEGDRVERK
VGKLLTALYYGTVGYTVEHTDEGNNSWIYVHAHT
- <SEQ ID No.:0070;PRT;Methanopyrus kandleri>
VREPTREESEEIKVVDAYVKRFQRLVQLEREAEMKAMEEEIRKLSGKEREEKGRAV
50 LGLRGTRAGREVGGYYLVKYGRSKEIDTQISVGDLVLVSRGDPLKSDLTGTVVEKT
KRSITVAFDSPPPKWAVGKGIRIDLYANDVTFQRMMEALERIRHAEGRLRELNTIIG
LKNPSDAEPIDVDFVDTDLNYSQREAVEHALGAPDFFLIHGPPGTGKTRTITEVIVQE

- 5 VRRGNKVLATAESNVAADNILEYLVERGVEAVRVGHPARVSKKLKERTLSAIVENHP
LYRKAERLRERAYRLIEKRDYQRPVPRWRRGMSDETILYLAREGKGARGVPPRVI
QSMKWIIHNRKVQKLFEEAERLEERAVREVLEEAEEVVTTNASAGLEFLEDIEFDV
AVVDEGSQATEPSALIPISRAKRFIMAGDHKQLPPTILSEEAQPELSRTLFERLIEKHP
10 KLSRMLRVQYRMHENIMEFPNREFYNGKLEAHSSVRRHTLEDLGVDPEVGRPWA
DVLHPKEPLGFVDTSRLPERLRERRRRPGSKSRENPMEEAIVAFLEQLVRQGLSQ
EDLAVISPYDDQVDLISKSLDELGLGDVEVNTVDGFGGREKEAIVVSFVRSNPKGEV
GFLRDMRRLNVAITRPRRKLICIGDSGTLSSHPTYRRFIEHVKRSALIKPNNLREVA
SYLDLVLRLAPGRARG
- 15 <SEQ ID No.:0071;PRT;Methanopyrus kandleri>
VRPFLSRLRALISYIKKTYDRVAVAYSGGTDSSVLLYAAVKALGRKNVACTACLPY
VVNVCPPTPMDEVKQIRIRPDVEDVLREGRDEHPCYLCKRAIYEAIHETIGGVDGVLD
GTNVSELTRGRPLRALYELDVDPVMIKCGLGDQTTSVLAAYLNLRARSGACSLVL
15 SPEWPDVEVNDPGKLNRTARLRKPQSERWSLSECLEFTIHAPLPERRRRERYECVR
RGDALVFRVLSGKVTEALASYFRECWNV
- 20 <SEQ ID No.:0072;PRT;Methanopyrus kandleri>
MIGRIFRRESKVVRDRLMKIRQTIDATEVDPTAVAETIGGPMESSSRSTEEGSEKAR
QDEVEEEPSRESHEESSAAEHSGVSAEAFLEMYSTRKGTAADVAYPLYEICKTLCL
AGILRRKTRKILEDLTAVRLPLLLASHNAVGPSTDLLEGFPKASGYQVSPYSADAL
RSLAPESIAVMGYKSGHVGAEPLRGWKMPNVCSWGVEAAVADELWDQAPVAVA
VTDITISALYGVYLSMLDAPALDFSYLWKFTKGKPLWRDPGRGGKHAIQWTQWKFL
RELKLDYLIVVSLKDRRFKRVVRLTLESEIKVKIVPIVSEDPRELGELLRTTLENQVPM
25 VGGEVHRTFQVEPVLVEFVKRAILAPLPVSDFNEAKSSRFYPLIIDISIE
- 30 <SEQ ID No.:0073;PRT;Methanopyrus kandleri>
VETFVLAHNYQRPDVQLMADSVGDSLELALAEAREIDADRIVMCGVDMAEVVKALN
PDREVVPDHRACGMAMRLRAKELREFRREHPDAADVYVNTSAEVKAEADVM
30 CTSANAVEVSSLPEDKIIIFVPDGNLAAWVQKHVPDKEVIPFPEHGCPVHHSLS
DLRELCSQHPDAADVWHPECPLEVCAMADFGSTSQIRQYCEKEDASKIVMGTEEG
LAFRIRRETGTEVIVPGHVMCPDMKINTGEKVERVLEARHVPEPLRVELDPDLISQV
EEVVEEMFRLTR
- 35 <SEQ ID No.:0074;PRT;Methanopyrus kandleri>
MMIRGDRLQVATDVHLHFNPVKGDGYKVFKEFHRAGGTGFVSPVLTLSYRIHGY
GREDFERAYRLHLEGVRYGRLEYPLRGYAALGWHPAEVATLAEHPEEEVLNVAE
TVCDLIEKFAAEYEEVVAVGEVGHYPVPAEVKRVCHKVFVRFLELAKDLDPVIY
HGPKASRKHYMRLYEYLKDVGFDFDRFVRHRATPDVSAARNVGIWPSVPASRRSV
40 REAAEHGPEFMLESYLDLDDPRRPNAALPLRAVPKAAIRLTIDPDLVSEVMIEIPERV
FGVEFEPLG
- 45 <SEQ ID No.:0075;PRT;Methanopyrus kandleri>
VWVELRRKYGRDRGHAPMSEEDVLRVKPKERPGVVFVTPDGRVHADLGHVRMVE
DTVTLHSDPTEPPGPDNPSVIVPEHVLAALYVSGYAGAVVEIRGDPGHAEHVWRAD
CYLREAVEELGGPADPPEMGEPAAKRAFIREFGEAPSTVRNVEGRIEPAEEFEVRVG
GEEVSVHDLMTVRRGNVSNKTPEHAGLDVVADVAMLAGTACARVEISRPTVTSIH
PTDLYLATAAKHGIRVCSLNVGRMRGAVNLEEGETVRVGTDLRYEVCITEEPVASEI
50 KIGDVTLVREGGKFRVVEPGTVRLGDEVVEVG
- <SEQ ID No.:0076;PRT;Methanopyrus kandleri>

LIDISLSWAVALGVVRGLYVFAGSFIAAAVYRYVÁEERIRMTTSAFMGLLTAGFAAG
PKELTALTYQNPVEMIAWAIATLFAIPARTYGDAIGERILRARIRASMNPRTKVYRLP
ENPNEIKDIPGEPPAPMEVKERIAGREYEFPRGTPKEEVERVIKRDLESETGIGRAVV
RVRNGDVEVLVAGAKPPVSHTLPPDKVAVSVEPLGGAIHIGEGDRVRVFDGRELG
5 EAEVWRRVDDRVLVMEERTAEEELLKEITQGKQVSLMAVRGEGS

<SEQ ID No.:0077;PRT;Methanopyrus kandleri>
LELVLTGTGAGYSVEEDGVEIPSDWKELAEELADHGGTPVCMVIGPQDSGKTTLVTFI
ANELVERGLKVGVVDADVGGQSDVGPPAVVSLGIVEDTVHDLSEVEMRHGYFVGSIT
10 PSGHLLQTTVGTTRMVDLALAEGTDVVLIDTSGMVHGGPARALKLHKVDAIRPSHV
AFLDRDGQVSHIKRMVKSLSKYIKVHDLAVPDAVKDVERKDRIRRRERVLRFFEERE
ILELDLEEVSQRAFIGTGEPVDLEESELSALIKAVSGVEPEILHAERAPDAVVLVVK
DQAGRIVGRGGRHARELRRLNVRFFVWNEEELQGVLVGLCDGAGDLLGIGVIREI
DFASGELKVEGRLLRDRITIRVQLGSLKVPETGSHEPMNVRV
15

<SEQ ID No.:0078;PRT;Methanopyrus kandleri>
VTRMYVGIDHGTSGIKVAAAYDGEDPEFLGKAPRRKVAERGLLRSLPDEARRAVEE
AECICLNHYGMGDALTEFTPLEEAEDLGVGYGLRDTSGAGREFGAGRRMVEELSEL
GVEAYLAPGIHRDLPRLDGAFRVFSHVASGEKLGARLALSSSKDIVVCDTSSNT
20 VSVVVKDGEVIGGIDACLGAPGVLLQGPLDLEAIRRIDAGELSANGAFSTGGIVKIVNC
AGEDPESAVEEFIQRCGKEEKEWLARLVAVEVAGLGVVYDCDEAWIGGTLSGDDE
FMGVLERVLSKAFNKVAGLPPEASASMGLALIAADIASGARSVLGVRISSRP

<SEQ ID No.:0079;PRT;Methanopyrus kandleri>
LISYLGPPGTFTEEEAERFSEEEELGGNGKLQSARTITAVFSRVERGEADYGVVPWE
NSLEGSVGETLDNFLHRSVRVFGELVLPVHALMSGSEPDDREPVVYSHPPQAYEQA
RETLRELLGNHEFVPTASTAEAAKLASKEGAYALGPPRLAERFGLDIMEEIRLENNE
TRFAIISRRDRAPTKEKTSVVFVSVTDRPGALREILGIFADRGINLTKIESRPAKRGLG
DYVFFLDFEGHRMLYPGSEALAE LRERTPF SKVLG SYPKVFP
30

<SEQ ID No.:0080;PRT;Methanopyrus kandleri>
VIEIRIHGRGGQGAVTAAEILAIAAKEDGKYSQAFFPFGVERRGAPVTAFARIDDEFIK
IRSQIYEPDHVIVLDSSLLAVVDVTEGLPEDGLVINAREEELDKIMEKFEDSDVYTV
ATQIALDELGVPIVNTAMVGAYLKASDILTDAVKKAIHARFSGEIAEKNVRAVERAY
35 REVKAVG

<SEQ ID No.:0081;PRT;Methanopyrus kandleri>
LGNEEFTIGAVVREPGSTKRNKTGRWRVFRPVLDQEKCMNCGLCFMYCPDGCIRP
SDDGYVIDYDYCKGCGICESVCPVNAIEMVLEEG
40

<SEQ ID No.:0082;PRT;Methanopyrus kandleri>
MTEVHVINGNYAVAEAVRMVDVDVIAAYPITPQTPIVEYLSEFVSNGELDAEFIHVES
EHSASAVLGASATGARVFTATASQGLALMHEILFIASGLRLPIVMAVANRALSAPINI
WCDHSDSVAQRDTSWIQLYCESNQEVFDTVVQAYRIAEHEDVLLPVMVCLDGFTL
45 SHTLEPVELPEEEEEVRSFVGKYEPTHCYLDPEDPMTLGPVGGPD SYMEFKMQHD
AMEKAREVIGE VNREFSDEFGRSYGDGLIEEYNTEDADYVVIAMG SVC GTVKHVID
EERP DVGLVRVKAYRPFP GDRIVEVIQDKEGVVTIDRAHSYGAMPPLWTDVKAHAP
DVDVSSTIAGLGGRDIRPQDVLEI I KVAEEGKGMD EPVWVINKV

<SEQ ID No.:0083;PRT;Methanopyrus kandleri>
VGNKRRVPIPEEELMAPGHRACAGCGSALCARLCMKALGKDTVVMPTGCIEVVT
PYPETAWEVPWIHVAFENAAVASGIERALKALGKEDVTAVLAGDGGTVDIGFQA
50

LSGMIERGHNIVYICYDNEAYMNTGVQRSGATPYFAATTTTPPGKIWKGEMRPKKDI
PKIIAAHGAPYVATACVSHPDQLIKVKKAKEVEGPAYVHVLCPGPPGWGHDSSSETI
EIAKLAVETGMWVLYEIENGEFRITYRPKERKPVKEYLKRQKRFQHLSEDDIEKIQR
MVDEQWKELEGKE

5

<SEQ ID No.:0084;PRT;Methanopyrus kandleri>
VEGARREGVKAWVGLPGCIGCVLCAEACPIGAIEIVDGRPQKCIHCDPERAMCARA
CPHHAIVQVCETLVVDRDRRCNGCGKCAEACPVGGIFIREDDAVKCDNCLDRDYPAC
VEVCPVAGADVAPVNERVLWRRSRAARTLRNLPGSGGHARRLGSRAARKHSRSH
SRSVARGRN

10

<SEQ ID No.:0085;PRT;Methanopyrus kandleri>
MPDDSDRELLESIAEATVEALRVAETKLPDDVLERVERALEEEEEDDHARMMLEAILE
NVRIAEKGLPMCQDTGLITVFAEIGREFPLRLAGTIRDGIEEGIRRATEEIPLRPNVV
HPISRENTGDNTGDRVPIVRFLPTKGEELRLHFLPKGFGSENSSAVTRLLPTEGLEG
VREFVIKTVREAGGMPCPPIVLGVGVGGTIDEAAHLAKLALFRPLNVRNPDPEIAKLE
EELLEINRLGVGPMGLGGRTTALAVNVELAYTHTAGLPVAVNVQCWAARRATAIV
YPDGFFEVTQREYPRG

15

20

<SEQ ID No.:0086;PRT;Methanopyrus kandleri>
LTEHHLEVPLEKEERLTELEVGDVYLSGTIITARDKAHQRIEFGEEPPVDLEGA
FVHAGPVVRRVDDGYELVVIGPTTSTRMAKYLEDIVDAGVKLVGKGGMGPDAP
EVMKDRAVYLTAPGGCAALLAERVKSIREVHWLDLGVPEAIWVLEVEEFGPLIVT
VDAHGNELAGE

25

<SEQ ID No.:0087;PRT;Methanopyrus kandleri>
VYVGRFLLAGKLEDGTPIAVYGVCSRSFSDRRIEVREGAAFFVVPEDPSYITEN
PYVTYTCAIRIVDEFLVLTNGAQTDPDIADKLESGVPPREALVSVTFAMDYEHDE
YNTPRISLITDGETFWLGRVAPEEVYFRVMKPKDGEGLSVYGEYAEVPSKPNMT
LDREDPLECDPVPSFEHYVCSVIARHDGGRWSLEAR

30

<SEQ ID No.:0088;PRT;Methanopyrus kandleri>
LKAWSKEAMTSFDVRATARELDSLLEGALIDKIYQVGERELKVKVHVPGVGSHYLV
WEPGMRVHLTWRPKPSPDQPTSVSQALRNTLSGDRIERTQLGFDRILRFDLRSG
RRVHVPELLPKGTAVTDENNVIERAFPARFRNRRAVVPGEVYEPPEGPPDPYELDR
DAFLELLLEADRDLVRTLAVDVGLGGLYAAEVLLRAGLYERRESHASEFEDELEEL
YETLRDLLEQISEGDLRPTLYRTTERDYVDVTPVPLERYSDELEMEEQDTFQALDE
YYVTKFLAEKEREVREEWEREKRRRLERTIERQRSSIEQLRTKAELRGRANALY
LNYNLVDGILSELRKAERKGYSLEIKRRIQEAKGSGIEEVERIADIDVENRRVILRL
PGENGEVTVVPIDSDVHSTASKLFDRAKELERKAERAQEVLRQERELEKLLEEGP
PEVELEELTVELTKRRKKDWYERFRWFISSDGFVVGGSDAHTNEIILRRYLEEHD
ILVHAHVHGAHVVIKTEGEEVPETTLREAAIFAASYRAWRWGLKAADVYVWTADQV
DKSAEAPHGGAIIRGKRNRWFRRTTELKVAIGVQVEGGYRVMGGPVSAVKKHCMTY
GVL EPGNERKSDVARRLFELFKKEVENLRRYLTVDVDMRAMPPGNARLLEVG

45

<SEQ ID No.:0089;PRT;Methanopyrus kandleri>
LEIFERPVEEIMTPAAEEVITAEPGEPLSKIFSKLERHGVKEIPIVDDGKVVGMIS
YYDVVDAHVADISNVRPETVMMKPETVPTDLIVEAITEMIDSGLRALPVVEDGEFV
GLVTEYDIIDVARESDDELTKIDAREVMSTPVITIHENDTIAKARAIMRDHGISRLP
VNDANKLRGIVTTTDDIIREVIKPITRLGKMDRKGEKVPAFGHPVKNIMSSPCVRA
EPDETVDLC EKIVEHGIRGMPIVNKL EPIGVVTRRDILRKIPELMRKRGVFVSLKGV
DDVDDFTLVI

50

LRKSIAAAVQKLASMRPSIEAVEVHIKRYHEEGNRHKYSVRIHVKDARNVISVKAHD
WDLIAAFKNAIRHLVREVLGEEEEKEETVRRKEAVKAKIKRRTA

<SEQ ID No.:0090;PRT;Methanopyrus kandleri>

5 MRVGDLSGEPEYKLALAAVHQGLGILAGYLCATGYSIVLVMALLILPFALGKVLERLL
ERERIGGAKGWLAYGLGAYLSAWILVWTFYINR

<SEQ ID No.:0091;PRT;Methanopyrus kandleri>

10 VVSIGRRVAVDRERCKGGSKCDYVCQRFPCPGVRTGRETITIDEDTNKPVISEELCS
GCGICAQKCPFDAIKVRLPEEELEECCVHKYEEGGFRLYRLPVPKPGKVTGVIGRNA
IGKTTAAKILTGELKPNLGDPEADPDWDEVIRAFSGTELQEHFRRDIADGDLRPMKP
QYVEALPKVVKGRVKDVLDELGVVDELIERLGLTEVTDRRISDLSSGELQRVAI
AAALSRDADFLVFDEPCSYLDVEQRLSLARSLREIVEDRGIPMLVIEHDLATLDYVAD
15 VVHVLYGKRGAYGVVSKPMGVGKGINAYLKGYLEAENVFRDEEVVLPEKPAAEAE
AGERDTLVEYGELVKEYDGDFFRLEVEPGEIRVGEIIGALGPNAIGKTTFFVKLLAGVLE
PTGGGVDVDVKVSYKPQYLEVDSDEPVEQVLRRTAGSEWGSSWYRSNIVEPLDLE
YLFDRPLCELSSGELQRVAVAAALSREADLYLLDEPSAYLDVEERINTARVIRRVIEA
RDAAAIIVDHDLLLLLDYISDRMMVFEGEPGKHGRANPPESKREAMNRFLSNLGVTF
20 RRDPETRRPRANKPGSHRDREQKRRGEYFYA

<SEQ ID No.:0092;PRT;Methanopyrus kandleri>

25 MITVLVLGDAHIPERAQEVPHTLKRKIEELAPVDVVISPGDYTTEDTIEWIASLGEKAL
MVGNCDFGLPLPPRVTEDIGEVKVTVDHGGSGVHPRGDPDQLAAIAEEEGADVIFT
GHTHRPEFKEHRGVLIVNPGSLTGVPSGGGSPSPGSPFMGTIDGKEVWMKLYMLK
GDRLETEEFETEL

<SEQ ID No.:0093;PRT;Methanopyrus kandleri>

30 LKPVEPCDLEVYADLRVPPNTHLVLRIDGRAFTKLTRRLGLKKPYDRRFAEAMAETA
VRMIRDAGLGITLVYTFSDLELNALIPRGNVPFSGRVEKLTSVSASCASTYFFRALQR
HGIDPTGETVSFDSRCVVLTDDDLVDYFKWRQDEAWRNHLNSYAYWALRERGLKP
KEAAERLRGMKAHDVHELLYREFGINLGRTPAWQRRGILAYRVAVNEDGVQRRRV
TRDWAPPFFDESEGERLIRACASQGYVSLDPAPDQVEE

<SEQ ID No.:0094;PRT;Methanopyrus kandleri>

35 MKKLSLALVGAGGIGTTVLREIREGRLEGKVEPVLVCDRHPEKLRKRIERWFPDCDTS
TDLDDAMSAEADVLEAASVEAAASLLPDALKRFDVIVMSVGALVLEEGLLSRCREV
AEVTGHRHLHVPSPGAVGGLDVLRLRGRVREVLTITIKPPKALNKDVSERTVLYEGS
VRDAVRKFPKNINVAAAVSLAVGDPSLVTVRIVCDPEVSVNTHVIEVESSAGTYRFE
40 LRNEALPDNPKTSAVAAYSVALIERMTEGIRVGT

<SEQ ID No.:0095;PRT;Methanopyrus kandleri>

45 MSVAIVEHLDRWSPWLDLEYMEAYRTARKHGWFTVTNADPEVLAKAKYPALPYS
ASKLPLRGDRVIVLDPDAEDPLTPEDDPDVVIVGGILGDYPRRHRTREELTPRFPDA
EVRHLGPYHFSIDGALRVALTVLECGVPLEEIQVVERPEIEVAPGHTVRLDCDYPSE
GKPMLEPEGLVEYLKEGIVDYEEAEFSARRRWRHRNDGVEGDP

<SEQ ID No.:0096;PRT;Methanopyrus kandleri>

50 VTNGESSNEEEYRKRYVRFQRLLGMEVFTEDGRRVGTVEDVTFDPRTGDLVRFLVI
VTEQPSGGGGLPLPGGGGRRRTETVDAELVKAVGDIIIESPEKASSGEEGKRKKQES
SPAKPSDLEI

<SEQ ID No.:0097;PRT;Methanopyrus kandleri>

VEVVGIIHHGHDAGAALIRDGEIVAAANEERFSRKKFHRGFPERSLQFVLERSNDVD
VLAVAGLYRKRKDLERVRDIAEELEVPVYLVEHHAHAASAYYTSGFNRLTITVDA
AGDGLSATVWVCERGEMHRVSTESYYDSLGDIFYANVTELLGFEPMKDEGKVMCL
AAYAEPDLRSVEWIRREVIDVEEGNIVNRLGAISGEAVRRLKRSKLAKMGRERAAAV
5 AQEALEELLLEYFGHYVNEYGENRIAYAGGVAANVVANMRLREELNIDLFVHPNMG
DGGLAVGAALWAWAEEELARGRRPEPRRLEDVYFGPEYDREEVRKALEEHDMTD
RAEYVGKDPDAIVRKLLEGKTVALFHSRMEYGPRALGARSILADPRDRGVVDKLNLR
DLGRDPFQPFAPTILSEDAPEYLRRPCESPMTLAFRATDTFRRKAPAVVHVDGTT
10 RPQTLRDELFPFYREVIETFREETGLGAVLNTSFNPHGEPVCSPRDALEAFEHGVAD
VLWIEGYMIERG

<SEQ ID No.:0098;PRT;Methanopyrus kandleri>
VPRPKVLYNVGMTADGKVVTAAAGDSRISGEEDLKEVHRLRAEHDAVAVGINTVRKD
DPMLNVRLVEGEDPIRVVFDTECSIPLDCRLVRTARDIPTVVLCAEADPGRVEKLEK
15 RGVKVEEVGACEDGVDVERGLELLYDMGVRTLLEGGPTLAWSFLKRGLIDEFRVA
VAPVLVGGSDALTPVEGEGFPRVDLGVGLELKRVERVGRDVVLWYEVSGSAADLA
SEHEEARGRSS

<SEQ ID No.:0099;PRT;Methanopyrus kandleri>
20 MKCPECGTEMRSELRDDGVELLRCPECGKEIKRVPSYREFGLKCPNFFEMTVPEW
DEEVLGKEVVVVVKYRSPDGYRRRKIRGKAVRIDNRGNLVIRREDGFEVSLYPQVV
ENIKVLE

<SEQ ID No.:0100;PRT;Methanopyrus kandleri>
25 VRAAVTMIAFVVLMSPVCAEVHILTWAGEGADSTCVARTKEIVDWWDTYRAIGPDT
TIVWHYTTRVDRWRTVLETGTDPLTGARISVVYPGGWHPERYWDFDWVRALYHA
QIDLIGIGYVGICAGAYLHAGNTTYSTSGPGHDDVLQDGVTVIDGMNGPNRICRVLIL
QDNPLTPEWTWGNVFTYKYWNGPGFGPEPGLEFNSSYKCWVKITNIEGREVMIKI
WPVGEYVDTCKGWAIVAGQYFVKEGDKWVPRGRFVLFGPHPELTSRTGAHALLAK
30 AILWAAGAKVPMEPQSPVQVVPKGTIPKALVAADVATALTFVLPEDVKEELFTAS
DPITQGIFETISNVIQDKLGLEVPPELTLTVTVATVVVYALEALIEWLFGTAPAPASA

<SEQ ID No.:0101;PRT;Methanopyrus kandleri>
35 MGLYLGVEGIDGVGKSSVNLAAEFLEIHGLEVTTVREPSTDIGREALEWDDPYLQA
LAFTLDRMLTLKRVDFAADVLSDRFTLSTLAYQSALGADMRWLLELQRPVPKPD
VVIIDREPLAEDATFDKEFLERVNRNRYREAAARLIEEEFDVEIKWIEAEDMDKEEIAEL
IVADARRRLDDPLGIPDDLLEG

<SEQ ID No.:0102;PRT;Methanopyrus kandleri>
40 VSYRRGADFERQLVRYLREHGGEAVRVAGSGGAVDVVGYAPAMGHVAVECKVRR
DDRLYVEKEEIEGLTTFAERFRAEPLIAWKPPHVRTGLPLNAVLFPPDLMEERERTY
VIDLETALEEGIDASRLVTRPLDHYRR

<SEQ ID No.:0103;PRT;Methanopyrus kandleri>
45 VCGIACAVGDDDDIAAMVTAMEHRGPDGRGFASVSDDGVEFSEPPSEGEVVLGHV
RLWVRGEASAVQPIVEEDRAVAVNGEIYNYRRFVEDAPSDSWAVFEVRSVRDAA
AALRVLRGEYAFVAAFRDGTVAARDPIGVRPLYCYEAGLAVASERKALWAAGFR
DVRRVPPGALLVLRDGRVELRNVVDVPRSRPGRSSWKDLLEVLQRSVRERVEETE
RVGVVLSGGVDSSTVAKLASEYVDVKCYAAGFEGSDDVEVAERLCDEMGWPFVS
50 VSLEDEFERYVATVYAVETWNP MKVEVGIPILACAGAMSDDGIRVMLSGQGADEL
LGGYHRHLRHYGDWDRFSWELWKDVAAIHAVNLERDDKAGMHHSVELRVPYLDL
DVVRTGLGIDPRENVSGPEDNLRKRALRRVAAELGLPDFVVERRKRATQYGSLSK

MLDKLVRELGIKRAVAKRLGYRSHKELFLRLVGKYLGFWEAPSVEEVERECARLG
VEPEISEFLEERVLTDFDSDLRAG

<SEQ ID No.:0104;PRT;Methanopyrus kandleri>

5 MVVLAFLVILLALTPLQPVQGQEVGTLAEHLRKAYGEDWPHYAPWVHSEIKVADDV
KAYNLRAVDLGYDLVPGVPAHGVLVAYASSSKVGLAFVNRTGEFFKLCEVPLEAPP
KYREGLDLDYMEAEGDSTKKTVLIWAGADNRLYALRVKLG VYRPHENANFPAVAEV
SNPIEIDLPPGYTDVKRVRVLALGDKFVFFFTARREDKPTTEYGYDLFYALIDPDGTV
10 KLGPKEFGFQDIMVFQVKPLNGPSLIGLAFMGRWRQYIAGVWWVTMRLEGNSIKVI
QTTLISDSDFEIPCVERALLDFSYPINSDEYSVLVWVWVNDRCRCPKVLFERIAQLVPGA
EFRYRKDKTWVYVGQRLKVDKNGYTSKLGKNFPMYLMVTQTQTISGGAVES
WDITFGEIDSVTVYTTTHGSEEKYFVVDASIKVFDVAISKWLNARTGEFEEKNTYGF
DILSVPLPVNPDSPGIVGTEVDMADVEVSLTNFGTSQTKQKWVAYPVFNKGGCEIIP
KDQPSPECFIYLYGTIQFNETHATETPIVAADQTDVKARLLPDGVIIIEGFIENINKKPSL
15 FVMPVAVVGPVKDIYLEYDTPDELLHKYIYPLDPFTVLKFRPIRTEDHPGAQVGPVT
YDLRSQQPALPTVYLEVSYTTDFSDRVAPGALVEILGPAPPEEPTPGTPLSGYAIIG
DPEVMRSENVEIERIVNEELAETQVHVKFLPPAVETLERIAQVVASGTIDREAVREAA
SDALDELSKYLKQYNLLQSPSGIPA EVDSALQTLGELRDRAQDMKDEELVMKLN TVI
NNLKR LVEGTYHVFVLYHPVGSVQ EYPKSIENREDLKRLVNELAYTGVT SWIPIDVD
20 CEVPNVVPETRTTETSGTALITEVPVLPPTESHSSAPKAGSQGQRGTEPVKPRGS
AGGTSSNPTLLPIVPYRRGLSRPRLRRRSCTRRAR

<SEQ ID No.:0105;PRT;Methanopyrus kandleri>

25 MREEAPPKIPEGLRITATRTMAAARPEEPEPTLRLFRFSPDRELVLEEKLDGNTNR
VYLEGDRLLAHTRGWVDADEYLRGLDIEPPWEDLRGEFDRITILEGELLPYDLFSQE
SPRLHELAGRLETEVLF DGEPSDLTAELVYLEGKRYECRPEPLFSRVCELDPDHELI
QRFLRENQVKPDFESAVAEGKLEPRVC FYELDMLEGSVKITAPRTEQLRECRRLST
EPPRWVRVVDPPDGLERELDRLEARNWCEGLCVKPMVETDDKLHAVKLRCPWFL
RREFDGRPPRRGSHKVAGRITAQLLQTKVLHKNLRELEGKRGVLDKKWRKLSERT
30 QRALRVQDRLLSLGLDSPRL

<SEQ ID No.:0106;PRT;Methanopyrus kandleri>

35 VTLMEECRRTVPDTRKIAEEEGVRPEKLARRVAEGRVVP AHADRRDEVRPVGIG
EGLRVKINANVGTSP EVCDPDLEVEKARA AVDHGADTVMDLSTGGDLREIRRRIMK
AVDVPVGTVPVYEA AVEMTRRGRAVVDMD EDDMLRAIERHMEDGVDFMTVHCAV
TLDALEDVLRGRALGIVSRGGAIVA AWMIHHD AENPLYENFDYILELAREHDVTL SL
GDAMRPGSVLDANDAAQHREL VVQGELVDRCREAGVQAMVEGPGHVPLDQIPAV
VRLQKRVC DGAPFYVLGPVPTDVAPGYDHIAAAIGGAIAAYHGADFLCYVTPAEHLA
LPDVKDVILGVIATRIAAHAADTARGMKYARRENEEMAEARWNLDWDRQFELAI DP
40 KKPRHYREERPPQAKELCSMCGEYCAIKILKDALEERR

<SEQ ID No.:0107;PRT;Methanopyrus kandleri>

45 MIHPSRLFVKLSASPRVDGEIVACGTYDPITEEEREIVETLNSMYMLLTRFEGYPLP
APQVISNELGEVAEELRREGFGLTKIEQFKYDDPEVALVSKIVLDETRYVYCTYRNE
NDLQSLAHECQCTVLECGGGEATVEAPSKFHALRF AVQVPLRLHGSA AIGLTQAAA
TERFAKAERHADSEFAAFSKIGA EWIIHRGGDPLPPPRRTNTAPDRILYLDIVGSSEL
VRERGRRYLEGIMSRVIDVINEEEGVLDHRRGGDDVIARFPTKSRAALAAIKIVGRL
TEDDVKIKIGIGDSRGRAAENAVTVRERVDYDCSYIAFRFGPYLVAYVEPPDYAVRIF
GRIPSESVRAVGASAIVGS LTALHPYLALPFFVYFPIAAAHNRNDSASVAVWWFLIWV
50 LVTL SAAWFGLYVREHYLPRPLVLEMNALFSQLMNLAKTMAARAGAGTP

<SEQ ID No.:0108;PRT;Methanopyrus kandleri>

VAKAERSDAGKDKVWIPDEEAKRIGADVSLQVLDALAKRDYPVYDLKKHAELDVR
 VAREVVREIGGMAGLEFSLKGVDTVLDFLSKIPVVKTVVAEEEELEPVAEEDRYVCFI
 AVDPNRYRELREKAGAI AVTAREELDLHTPLVLVRNDLCVGPEEFGVLALHSSEVA
 KERPPFKVEVLVGEDLKPTMIRLARFIAS TVATRTVYLKFPYVVVKESLLVEKGDYKV
 5 RVKTPEEVE

<SEQ ID No.:0109;PRT;Methanopyrus kandleri>

LRVVMKFGGTSVGTGESIRKVAKIVTDAEEHEVIVVVSAMSGVTDELVRAAESAPD
 WTEEDVKNFVGKLRRRHGKAASEAISSDLIRREVMGYVDSLLEELEKVLLGLSYVG
 10 EVTPRSM DLILSFGERM SAPIVAGALRDRGLEAEHLEGGEAGVITDDGFGEAEPILP
 ACRRKAQKTLIPMIESGKIPVITGFIGRTIDGEVTTLGRGGS DYSAIIGCISEADEVQI
 WTDVDGVMTANPNLVPDARTVPRLSYEEAMELASFGAEVLHPKTVIPARSENIPRV
 KNTFNPES EGTITSESEPSEQVVKAVASSSDVGMIDIRGTTMIGRPGVAGRIFSR
 GDEGINVIMISQSASESNISIVSRPEVRRARIIEREFVGERVVERVTYEDVAVVAV
 15 VGEGMRGTPGVASRVFRAVADAGVNIKTISQGASEVNISFVVAEEDEAAAVNAVHS
 EFELGEEA

<SEQ ID No.:0110;PRT;Methanopyrus kandleri>

MIRRLVERYLRHVTKKRLTRRPTTALIYTCLLGMKAIARAFSEETISSISPEPLWTVES
 20 VSLVRIGTYPGDVLCSELVSFLTREFEEEEERVEDVLPEVEVEAEFLARVRRFNDLLY
 EDIELPFEIEGTGEEEPDLDLRLIEVLLALDEIPQSEQGRYAKPFILTCFETLSDYLDVL
 GLRWSDVDTVRRKVRIKGRVHRISRALAYELRRIPREGEEVFPISSDVMRWERAV
 SKEVGRRLRFL

<SEQ ID No.:0111;PRT;Methanopyrus kandleri>

MYAPVRRGCSKLKLPEHVREYLDRKGIWELFPPQREAVEKGLFDDENLLIAAPTAS
 GKTLLAEMRALHELIESHGETRVVYVPFRALAREKYEELTNVIEFCREKGLEPTIEIS
 TGDVRRPIREL RPGITVTTAEKLDASLRSRPSLVEEVDLLVLDEVHIVGDRNRGATYE
 ALIALVRTFREKVSL LALSATVGNAAELADWLDATPVISDWRPVKLEHRIVEVPSASE
 30 KDAKVRKLIRKCLREGGQALVFLYSRRRAMTEAKNLSRTVSGLLSEDEKKELRTLAE
 RVSELGEGEETEILAYAVMRGVAFHHAGLTAEQRALVEDAFREGLLKVVVSTPTLAA
 GVNLPARYVIIKDFGMRLGNEIKPTKNEFKQMAGRAGRPGYDDMGLVFLTTSNWK
 ELAEEYVHSEADPVQSRIWVSGPQLRRFLLGLVAAGFCRQIADV MRVALNTFMSSV
 NIRPEDAVLSSLKMLVDWGFLEELEGETATKVGHAVSQSYLTPDSAKFLLRCMEE
 35 VGTEENVVLPSITLCPDFQPAPISSKSRELSTLDAFMGGSPSIEADEVLELAVEEFGY
 DDWELERRLAWAEALSDWVSGSPDRSILRKYDLYPGDLYRAKDDAAWIAWGM SR
 LARAAGITWRSPLLSRRL EYGVPEKEALEL TEVEGVGRTLAMRLYRAGYHSVRDLAE
 ATPELTRVRGIGEQ LARKILESARRLTGT

<SEQ ID No.:0112;PRT;Methanopyrus kandleri>

LRRLKIEGRAYIHPTATVLGEVELGQDASLWPGAVVRGDLEPVRIGRESNIQDNAV
 40 HVSKGY PVEIGDRVSVGHGAVVHGATIEEDCLIGMNATVMNGAVIRRGSIIGAGAVV
 TEGTEVG PYEIWVGVP AKRIGTTDEERVDEIRENARRY LKLAREELPEWRG

<SEQ ID No.:0113;PRT;Methanopyrus kandleri>

MGCECIGGNVVKALGLDVGGAHTDAALVRYDEDGKVMVLGTD RVYLP MWKKKKR
 LKKTIKRIVHKFKPDVVGLTMTGELADAFNTRREGVEYIVRTVTSACHAPVYVVTSD
 GSTVPPEEALRRWREVASANWRATAEVLAVHVRPGSYLLVDLGSTTLDLIPIIRGEVA
 AEGRTDLERMKN GELAYLGALRTPISFLLREVEIDGEPVPVS YEYFSIVADALLLGEI
 50 DPEDYTPETPDGRGKSPEECARRLARTVCSDPEELGWEGVMDLAKTAVRALLGQL
 LKHIELKLQEHGLDTVVAAGAGDFLIEMACKRIGVEVEPFDEIFGKGSEVAPAVGA AF
 LAIRR

<SEQ ID No.:0114;PRT;Methanopyrus kandleri>

MRVYIY EYAVATGDEEFLAEGRAMLESLLRAFAKSGYETLTVAHPSVGVWRADEVL
RDETQALECADLTLVIAPESDGLLESKVREYSRETEVIGPTPRAIRVAADKRKTEDAL
5 RDARSFQLPTREADVMVSKPADGAGSEGVRI GRGELSRELIPGSHHSLLCVSDGET
VDVLGINDQFVAFAGREL VYLGGRTPSDHREL TRIARDIAEEVVERIPGLVGLFGVDL
VMKGGEPYLI EVNPRPTTPTVAAALEHPEAVRSLL EGPTGKVLRYRREYVYVKRG
AEALVPEKFEVWEDFHGLRVYRG

<SEQ ID No.:0115;PRT;Methanopyrus kandleri>

MTDIVYDVEGFRAFLPKETLRWIRHRELERKVG VVEKFSDRVGPIPV EIRRRRSQYG
EFYHAGKGTTRI QARVSAAMECVERAAAEPRE EIIERGPEGDKWTPAWYRTEPRE
WVEGVDLTTR EPVYVPAN EVFHPWLGDALPSHTNGLSAGRLREEAVIQGLLEVVER
DSWSIVEYFRIHPPELEVHGELEELRRSLEREVGRVELRLLPSRVEGVYVVGAVTEA
15 ERVEEMVMGFGASPDPEMAVLRALLEVAQGLSMARRGIESPVRKGLGEFSAPGKL
TPERLKRNLNRHWFEP EGTVEIDDLDRVITTSLEKLTEELVERVAEAGLGKVIEVDLT
LENLDVPVVRVRVTGASEYVIDEARVGNMPEKPPGVPMG

<SEQ ID No.:0116;PRT;Methanopyrus kandleri>

VEINGVEIEDTFAEAFEAKMARVLITAASHKWAMI AVKEATGFGTSVIMCPAEAGIDC
GYVPPEETPDGRPGVTIMIGHNDEDELKEQLLDRIGQCVM TAPTASAFDAMPEAEK
EDEDRVGYKLSFFGDGYQEEDELDGRKVWKIPVVEGEFIVEDSFGITTVAGGNFYI
MAESQPAGLQAAEA AVDAIKGVEGAYAPFP GGIVASASKVGSKQYDFLPASTNDAY
25 CPTVEDNELPEGVKCVYEIVINGLNEEAVKEAMRVGIEAACQQPGVVKISAGNFGG
KLGQYEIHLHDLF

<SEQ ID No.:0117;PRT;Methanopyrus kandleri>

VSVSVS VDAETNVVGLIGHPV EHSLS PAMHNAAFKELGLNYVYLAFDVPPERLEGA
VRGAADLGIVGLNVTIPHKEAVMELCDELDRDAELIGAVNTVRF SRGKIEGFNTDGE
30 GFLRALREETYFDPRGTKSVILGAGGAARAVSFKLATEGADEIVIANRTVDRAERLA
EELKEKVG VKARAIGLDGDEIERELRDADLLVDATPVGMYPNEDEPPLVTADQMHE
DLIVNDLVYNPPRTR LLEEA EKAGATPVSGVGMLVYQGALAFELWTGEEAPVEVMR
EAVLEHLR

<SEQ ID No.:0118;PRT;Methanopyrus kandleri>

MLDVTRLPGDRLLISSDIHVGDEYQGH DRETWEAALDLARDFDAFLIDGDLADPRAS
DPELRELLRDLRELSSEVPTYFVPGNHDTV DLVKSRLRDAGVHVLSRRYDNRRGRG
CPPGHSGPSLGGPHLLRFGDAWMLVLHGHEPCSELGLNPQKPVNPVARESPMPK
RDQILDNYTCREYEMPDRLEE IARSTHADVVITGHTHCRYLGSLEGKLVNVGTTSC
40 PAICATCRDPLNVGNVCILKASGGTLRAKLFNLRKARVIGRERVIRGR

<SEQ ID No.:0119;PRT;Methanopyrus kandleri>

MEVPLLEVLLYTDG SVTRILERFFEEVTIDPLETRKLV EGREARLLGVPDGD TVYVR
RVVIKVDGRPAILATSLARPDNLPGRLRRLVLQSRKPLGKMIEELRLETRREILRVEE
45 ARPSPEDEEILDVSVPKIPWREYLVYHRRTPM LLIRERFNPEVLGREG

<SEQ ID No.:0120;PRT;Methanopyrus kandleri>

MMLSEDKLQKIKELENQLVKTREELDDLEEK RQEIQRKIDQLRSQIHEIRERA EKYRA
KRDELNERVREL RERADEHRRRRDELNEEVQ QYKAKRDELNERARELAQKAREHV
50 ETAKKLRSKVGRPIREIRAEIRRLEREIETNPLSPRREEQIAQRLEELREQLRAW EKA
NEHSSKADELFSQADELREKASEYHEKVVKTAEEADKYHQKMI ECYERADKLEKA

DGYHRKYVEELAKVKPLEDELRELQSELRLDLEQKIMEKRAEERALEVRIKDLEKQAV
DEERLKEIKERLERGERKVSWEELQLLQEYGEN

<SEQ ID No.:0121;PRT;Methanopyrus kandleri>

5 MAQARRLVLDLDFDGTLDGETIDLIAEAAAGVDDEVEEITRRAMRGELEFGEALRERV
RLLAGTPASVLDEVVTELRLNPGVREFVAAVRSVGA AVAVISGGFTEV VSHFCREL
GLDAYVANELEVRNGFLTGRVYGPVMSSSAKGRVLMELCRRFGTRPEDTVAVGDG
ANDASMLKRVGLPLGFRPKKPLYEIIEMAFDDFRRAPVVLRFWGV PVE

10 <SEQ ID No.:0122;PRT;Methanopyrus kandleri>

VFGLEDVHSHVRAVEKHHHEWLKKCLPMIASENVTS PAVREMLVTD FGHRYAEGKP
GERLYEGCEYIDEVELACVRLAKELFGAEHANVQPTSGV VANLAALFALTEPGDTIL
GLRISHGGHISHHDISAPGVRGLNVEYLPFDEEDMAIDVDGMVRKIEEVEPSVVMLG
15 ASLFLFPHPVEEAVEAVEAVGGYVYDAAHVLGLIAGGQFQDPIREGAHVVTGSTH
KTFPGPQGGIVLCQRDLADDIDEAVFPGLVSNHHLHHVAALAVALA EFKYGERYA
RDTVRNAKALAEALYA EGLRVLC EHRGFTESHQIAVDVREQGGGAVIAEKLESANIL
CNKNLLPWDDESKSHDPSGIRLGTQELTRLGMGLSEMEYIAELIADV LGRREPSE
VRKDVEELRREFQEVKYGFGSGVGAHEWPRLADW

20 <SEQ ID No.:0123;PRT;Methanopyrus kandleri>

LVEARALAEAVTKGVLTHVEVSVKPGSGLVLDVDVPRADRVKDIVRSLVTPITGMYQ
VRVRITNARAEPEAANKKCLATGTFTALGKALMDAFFPGRGTEAVNKALLRVPITSE
EAYRGKRFD RYVDPRKKRWIPARPGMMCR TKDGMICAVTDDPDGIAPPAAAEKDA
KLATVLC DTLFDMLLA EKPPTVRG

25 <SEQ ID No.:0124;PRT;Methanopyrus kandleri>

VRPESEGVRQAARLMAVAARTAPKTRGIDDIVIEVEDEDTLEKIAERMEEIAEEKGA
DFFKRDAECLRRSECLVLIGVKSSGPCGLNCGMCGASCDDIEERSADVEFAGPICG
FKLIDL GIALGSAKVANDLVVDNRLMYTIGVAARSLGVVDADVVIGIPLSATGKNIYF
30 DREG

<SEQ ID No.:0125;PRT;Methanopyrus kandleri>

MARNPRRKGRDGWKQSKSRGKPSFVTCECCGGKVPRHKAIPWTQGFRITDPVVR
QAVDDRYVHTFSRKVYYCPKCARFLGIRKPKRR

35 <SEQ ID No.:0126;PRT;Methanopyrus kandleri>

LGGGSVGHVVADALDRGEEVIVDCNEDRAEVLREQGFDVIIGDITEKEVLLKAGI
ERAVMVYVLT PDDANAEAIRLIREINEDTYVIARVTDEERVEEFKELGADEV LSPNQ
LLVEKLLHNIDNVRNRRKVHELLTKLEDVETLAIIPHNNPD PDSIASAVALQEIASIVDV
40 QSDVYGGGEIGHQENKALVNLLDIEMKRISRVDLDEYDAIAVVDTPVLPRELA EYDGI
EDRILVAVDHHDS SDGMMDMNGT SKSALELADFVDHRPEVGAASTILTQYLKILDR
NVDRIATALLYGIRTD LNFTRNVSPEDLKAAAYLYPRADHEALAKIESPDISPETLD
VLGEAIRNRTVIRS YLFSNVGFVKNEDALPQAADYLLNLEGVHTVIVFGVNGKV KIS
ARTDDIRLNIGEIMKEAFGDVGSAGGHSKAAA AEIPLGIFQDVESDMVLDLVEQAVR
45 KRIFKVI GIEEEED

<SEQ ID No.:0127;PRT;Methanopyrus kandleri>

VNGLCGIVGYTGERDAAPIVDSLVRLEYRGYDSAGVATIHEGRLYLEKDAGKLTEG
GEPTKLQRSLRKLPGKIGIGHTRWATHGDPNRRNAHPHTDCRDEIAV VHNHNGIENFM
50 QLREELEDKGHRFDSETDTEVPHLIEQGMKEGKSFF EAFVEAVRRLEGSYAIAAIC
TREP D VILAARKESPLV VGLGDDGNFLASDIPAILPETNRVIPIDDGEIVVVKRDEV RIL
DAETLEDVTEEKEVQIVEEDPHTLERRGYPHFMLKEIHEQPEAVRNTLR IERENLME

MAEELVGGDYTKLYIVACGTSYHAGLGAKYATELLAKFPVDVVIASEFRYVTKELVD
ENTLVLAISQSGETADTLAAVREANARGATTIALTNNVVGSTITREVDHVMYTHAGFE
KAVAATKTYTAQLAAMYTLAVELARHFGEITNKEAEEYHAELNKVPEMLEEVLSWE
REREIAVMGGRYKERPNWFFIGRGPGYPTAMEGALKLKEITYQHAEAYPAGELKHG
5 PLALIEEGVPVVAQAQPGGVYEKMLANIEEVKARGATVITVADEKDEAVEEHSDHVI
RVPSISEVFSPIVYTVPLQLLAYYMSVARGIDPDYPRNLAKSVTVE

<SEQ ID No.:0128;PRT;Methanopyrus kandleri>
VIRLDVRERVVKLLCDYISIPSVSGEEEELSERYASDLERAGLEVEIDRLGNVIGRRG
10 EPEVCLTSHLDTVPPDEMEKPFEPRIVDGKLYGRGACDAKANLAVYATLAEIWDGP
LEIIAVVREETDSAGIRHVLRRGEIQANHVINGEPTELRPVIGHKSRVEVRLCIEGEPK
HAGSHNPENPILKFCKILHDLHEMLEDLEDALGVPTANPTSVHSRGVATNVTPQCLE
AVLDVRLNTQLSPEDLERFFHEVEGVSAEIRAGAPPFVLSGDEPVVRALREALSAR
GLPDEPITWPASTDAGYIRNLGGKDVVVFPGPSIDYAHSPSEHVPIEELVDAVRVLY
15 DWEYLSS

<SEQ ID No.:0129;PRT;Methanopyrus kandleri>
VREEDLDWEEIGLRVGLIHRQLDTSRKLFRCRTPELVEEVPKEPKVRRKLRPVQS
EMGEFDPAALEEFKRDRTFYLLADGSFSCVELDEEPPHEPCSEALDVAIKVTLLG
20 GSVVDEVHVMRKMVIDGNSNTTGQRTMLVGFGEVPTSEGPVRISTVCLEEDAAR
KVKGRDQDLEVDYCLDRLGIPLIEVSTEPDIRTPEQAREAAERIGEAIAVGGVKSGI
GTVRQDVNVISIEGAVQEIKGVQDLNLIPKVVKYEALRQANLLRIRDELRRGVSET
DLIDCEPMDVTDVFDTDSEVIRRELERGGVVYALLPGFEGILGWELCPGRRFGTE
LADYARRRGVSGLFHSDLPKYGISEEEVEAVRQRLGAEDGDGFVLIAGPEDRVKS
25 AMEAVKDRAIMALKGVPAETRRARKDGTTEYMRPRPGAARMYPETDIPPVIDEDR
VKELAEELPEKPWERKERLAEYGLGEELVEQMFEHGVVDEFEEIVEETGVEPKVA
AATLVNTIPRLEKDGYPVDNLTIDHVKEVLRLYAEGAIKSGIEELLGALAADPDSDP
EELAEELGIVMASEEEIEEVVEEAIRRYEDKIRERGMAMVGKIMGEVMEVLRGRADG
KRVSELVRERIREISGE

<SEQ ID No.:0130;PRT;Methanopyrus kandleri>
VLEVTLPGEGTPPAEGFRTLHSLKRDRLERYFRGYPVDFDDVPVRINVSGKPREVLEL
VREIPYGTVVTYGDIAQKANTHPRVVGVS LARNRVPIIVACHRVVAADGLGGFRWG
LEWKRRLLLELEGALPSRR

<SEQ ID No.:0131;PRT;Methanopyrus kandleri>
VIVDREELEYDGSQRLRRAFAHERYGIKGRAVVVFRGPM DV RTEYTADAEDVGSPIR
GNDVLHLLVDDPTRADPLVAGLLQRLLVVVTKEVIEKELSTD LDRDGDLLHDGRKL
30 TVSVFKPAGPGSLAHLGINVTTEGVVPASSLRDLGYRGDPLDLGRRVAVEFVREIT
DVELDLTKIRW

<SEQ ID No.:0132;PRT;Methanopyrus kandleri>
VVRDLNEAVVIRIETPERSERVKVPYREGMTLLDALRWIKEHEIPDLEFEFSCRNAQ
CGTCAVLVNGKARLACEYRLEPGQEVTVGPLRHLPVVKDLAVDWSAVTSRLRPLS
45 PKSHREWFRMEPEKQRKLYELRSCIECLCCVAECPVIKAGSARNPGPIVLRKVAE
EAEKWDESPEIDDSVYACTTCHTCAEVCPKDIEIPAKAVETVRARLYEEGKGPLPEH
KELGERAVRTGRSVEKRD RS FLEEYSGEYGEGDV KAMFFT GCLVDYRLPDTGKAL
VRLAEELGIRLIVPREQVCCGSPLLRTGQHDRAERLAFENLETFRVDPDVIVTVCA
GCGATLKNYPPELLGDRFEWDVLDVTELLVEIRAHERGFRLPERTTVTYHDPCHLK
50 RGQGVEDEPRKLIRSIENVEFVEMEEDRCCGAGGGVRSGLPELAELMSDVKAHM
VRETGAEVLTTVCPFCEYNLREGLERNDVEARVENLTVLLSRL

<SEQ ID No.:0133;PRT;Methanopyrus kandleri>

MSGDKDRRLPFDRDREMITKAEVETDPRYGCPPEERPIEEYIMKGVINLDKPAGPTS
HEVVAWVKEIFGLSKAGHGGTLDPKVTGVLPIALEKATKIIQTLLPAGKEYVTIMHLH
GDVDEEELERVVKEFEGTILQRPPLRSVAKRRVRPKKIYYIDILEIDGRDVLMRVGCQ
5 AGTYIRKLCHDIGEALGVGAHMAELRRTRTGPFSEENAVTLHDVKDAYEFWKEEG
WEEPLRHVVRPMEEGLEHLPRIEIRDTAVDAICHGANLAAPGIVRVEKGIQPGDLVAI
FTLKGEAVALGVAKATWKEMLHADRGIMVDTKRVLMEPGTYPKAWGLKTPGE

<SEQ ID No.:0134;PRT;Methanopyrus kandleri>

10 MSSRLTLVIAFVLLIAVSPVHAGKLVITGYWSTGMPAAKAASGLPVTVIVEDTVSKGF
VPEEHVREAVESADTLLLIHTTSNTVFGNVNLNLFSESSSEKRVFEFDNVLPGPSEV
KSLDSVKVNWYGLEIPLSLYVQSRSVRNFRSLFSYFLERHPGPYPHFDGWVEGYDF
ERDEVIRPSDPNPGEVMTLIERYGDDGVILGNTRYPAWFVELLRKHLDPDIIIEVLSKE
PRREGPTVLVIVDTTRMESGWTAPIRELCKALRERGLNPMVLGLHYDILDGCLEDVL
15 LALKRIVSEYNVQTIALLPGFFKMRSPDSPEVELLKELNLPVIKLVSLPWTMSEWQTC
WRTPSGLDWFALYHIVIPENLGAIEGIPISVREWRKDGPEALLDRVWCSDTPVPPEMI
RIAADRILAWIELRNTPNREKRVLVYAAEPGKEGVGTASSLDVPASVNFRAWLM
KASYRVEIPEELKEKLLFADEIPAEARGLSIEEMLLRIAELEERAEEAQAEGRWKEA
LDLYYKAYRLIRPLADALGRMLVEEGSNVYGAYILRRVNVEGHRLVRLLAYEHGRFV
20 EREQEIRYLHLLPLDEYLVKWRSLPEEARLCMEKGIFGYLEAVLLQIKHGPITDPLK
LQAIVNLGLKSLVSYVAGHLQYLDVPEETKEQFQRDVESLVDVIGALTDPKEVNQAL
ELCRSLHAKWGRVEAFYGWFTGWGPPERSRYLVEIDGKKYFVIRGIDFGNVIVAPQ
PARGYYVGISVAYHSTVLPPCHYYLACYYYFTRVFRAHVIVNTGKHGTYEWLPYKPL
FMSWWDFPQICIQNVPPQVYPYVADPSEALVAKRRGWAVIVNYLPQSLVKEELTGD
25 MGQLELLERYQSSHLSSLKPAILDLVKKTRAYELLNLSSLEAFERKFDENCAKLYFL
LHDLLEEHEVVPIGHLVFGMPPIGEDPVGTVASFAAKVLLNEVMGALDYSRALDVCR
EVIERPETRDADDLHREAARIVELLFESARLERTNFLNALSGGYVPPGFNSSPFKQID
ALPTGRNACMFDPKRWPDWISINVAYTVAIPLRTVTRKVAFDWDATDNINTRGLPIA
VQMLLLGVLPHRNADWVVTGVDPSLCMNPSGVSYTRRLGQILVVGRIVRMESLGS
30 GAVRLVLEPPMGGQRIEVRCPVNVLPILPHLDDEVMLVGLTLVSTGGRVEVVNARVL
SEEEAKRIEDEVLTPTQLSAVGRAFGRPLIRGRVERVEGRYIVLTDGCTEVRVRIDE
GRVPEEGETVTVTIGTVTLVGDEPVISASLVLEVPRLTDVIVTGTSCFRDVFHNL
TEFLGRVAAILAAEPYLARLLSHSSLIVSDVDKVLIRGIDEYPVYVWRRWLRETVE
RLSQGEWKNPIHETVLHVYRAALWRALTTPDEELARELEEGLRRLYDLVGEFCAEH
35 GYDFESVVNTAASLAVLVPPAENYPFLDWAAYVLALLTCRESNITSAPDAGSGGSP
NGGIITGWIEQVREVPDEDLPLLAALNVFCQAPGDYTNVIGKTIESGEFLLEDRLNLA
LSWISGLSYVYGPKHWGASFPLLLALNLAAPDRTLHTMVSSDEKATFFYDDCIYAFE
GGLRLAVSAVNGLLPEQETMIDALVLNLRNAALGSYVGGDYSQMARRLAEEIQLMA
AANPNLAPWLRDLASQLSAGSYLAALLASNMTSLFSTVTTRTLALTGNETAAFRYS
40 LLMPFDTYAWYDLMRTVFNVPYVRGLRFHGYSGAVELLKRLGYLIRGWSTLALGLL
GWEGIFRRTASTLVENREWLARYSPEGLFSLAVSLLVIAYDRAQHKLISEEVLSRE
FVALVRDVIVPELLRGVLCCCPGVCNPNVQQRLLEALSQYEGLVNLRAMAVFA
ANYMNNPELVARILRQLTSPAFTRETAPMAARTVRTLAVRATASQAVAISATIAAILA
SQAALSGPGRGAVPVSVTVGLLRGTGAKSAATVEVSVGSSAGKGKPSQERSARA
45 SILRRTSAQSPVTTSVPRWILVALIVALAAILVGLWRPRIGTSRGW

<SEQ ID No.:0135;PRT;Methanopyrus kandleri>

VRQLLVILCCVTAIGPVSAATLEDADQCLKDSVWVLVENQFTEQDVGKTYTLRDPG
GTYNKGQYEVHFATEQDGLQDEGVASRDFTVEDVDVGTWPTTYKGD CRVIYVKK
50 YNYFPSDYGLETVKLGDKIVALIDNSKCVIYVKKNDKYGYVGGEGPGYS DTKFTVP
MLVLAVEEGVTDEQFKNVKAIRKWLTVSSPRGYYYQYSLKDIRTTLEESGYIRTG
SIGGVCLYQLIPLLVGRELGLVDDDLWNSVKDDAVYVIKNGILVPEVYCSSKQDKKD

VLIVDSKNEIAYWVRQRLKDDTWVDYSAVYDTAGAVLTLIYAVKTGLISGDDDDVDVG
GSTYKVADIHKYAVNFLVERFYEGNGNPCFLEKQAVEQGLYWKSYYPVKYAFYAL
WAIREAEKAGYLSDKAKDLLHDALRRYVCWLYGMQLEDKPGYFPYNEYIKGSPDFA
STCAALLGLCTAVELGYEDDMAIQLMKNVVALVSQYKEAKEKGLKYYFYVPTPQS
5 YYYLYMSRFFEGREANQCAFATAHVVAALAAVEGLPESVRSEIFGHTVELKVEVPR
ETRVGTPVTIQIEVTIDGQPASSGEVRVYEGDRIIGVADVSDGKATITYTPEKRGEHR
LKIEYRDPKYGVKSTTIVIKAKKKAPAVSPAVALSVLALALRRRP

<SEQ ID No.:0136;PRT;Methanopyrus kandleri>

10 LSEVPPEEFQKDVVEIKRRLREGELTNLGAALAVVLLASLKGQWINVDEIVRVLKELGY
NVKANSIRSALYKVRQEGLLKSKRLGRKTAYFIPVDDDET LGAILRRVTGEEVREKIV
EELLEIIHGD

<SEQ ID No.:0137;PRT;Methanopyrus kandleri>

15 WVAVAFPWSLFSEETDPKIYAYRVGTLARALAIYRVVEEVYLYGDGVGTRRNAERLRK
LLEYQCECPQYLRKRVRFLDRDLRYAGVMPPLRAPHHKVHSPKEGEVREGYVVRRS
RNGALVDVGADRLARTWRFRKPHERVTVRIVSEDPLEVEPAEPEEYWGVRVIVN
ELNEVLREFKEGIIVTSRYGEDVREVEFKSPVKCLVFGSSEVSVLDVDPGVRDEYPV
INFVPNQGVQVVRTEEAVHTTLAVLNLYGLI

20 <SEQ ID No.:0138;PRT;Methanopyrus kandleri>

LRVASGLEPQEGYEIGVVVDALRASSTIVTALALEAEIVPLSSPEELKRVDGPTIGE
QHGGKIDFADYGNSTDLLRHAEIEGETLYMVTNNGTDTILRAAEVHEEVLIGSLLN
ASAVASKLSGDTCFVEAGHRGMLAVEDTYTAGYIARLAGGEPADGRTRAAMEMAR
25 GLPAEEVFKGSRTGHVLEQRGRLEDVEFCARVDEFEVVPVYEDGMVVPQ

<SEQ ID No.:0139;PRT;Methanopyrus kandleri>

30 LLMDRFEMFGSELYVLRTAHAGVDGDRVRRKILELDPEAVLVELCEGRLLSFLAELR
GERAGSRTGGITGRLVAVAERIVGRVVGELGEDVKGAIEAALEAEIVPVDMDIS
WVFRRMKMKASRWELLKFQFSVAIDVLRSLLRPGQTRDVVLSSVADEEAAREMVQ
GLRRAFPRIAEVLIDERNRVIAENTIEFLHSREDVTKAVLVIGAAHYGVLDILRDAELE
SASRHDDDETASGEGEEETAG

<SEQ ID No.:0140;PRT;Methanopyrus kandleri>

35 MRVLFLGYRYGSRAAENVGSRSDFDVEFLKVKEPPENVILDEEYARTLLPPSYSGF
DLVISYLQHPDLQLALAEVCDSPILYGITPDPAVREKIERSHDAVAFPETTMCSLLPD
TGIPVDRFAERFGRPKLEVSVSGGKIRTVRVVRGAPCGATWVAAERVEGMSVDE
EAVNAFALAACHHCVAPRFGKFESKDVTAYLHGVALAEALGIELDVDLEGFELPI

40 <SEQ ID No.:0141;PRT;Methanopyrus kandleri>

LPGLTALAVLELLGTGFIAGYLGGIIGTGGCVLMLPMLVFLLYKPIPEAIATTVFVAVW
TATFGTMSHAKLGNIDYETSAIVLAAGAIGALLGSVIFALIMKHTGALQVILGAAFLYA
AVRMIYEWIKKIPGSEADEIPGKPSSKAAIGFGIGILTGILGLGGGYALVPSFIYLLDAP
VHLAVGTSMISMIPMATVSAAYKMAQGLTDLVGGTLLGLGTIAGVKLGAKTTQKIKP
45 WTIKGIFGVVFLYISLKFILQGLGIKLL

<SEQ ID No.:0142;PRT;Methanopyrus kandleri>

50 VPRKILVPFDGSEPAELALKWALLDAHDHGFPIKVMYVVDRLDLLTGFAPRETVLK
ELKERGEKILEEAEQIAGELGVDVKIEKKVCVGIPWREIVREAEDDEEINLIVMGSHG
RTGPEHAILGSAENVIRHSPVNVLVVKREKRVEDSVEESSRR

<SEQ ID No.:0143;PRT;Methanopyrus kandleri>

MIPDPSMMLYLIGIGGLVGLVSGMFGVGGGFLVPLLNSTGMPMHLALGTTLLAISLG
 GFTGAYRHLQEGNVHVDAAPIFGLSAIVGAQVGSYLACTPEHVLKVALGVACSAM
 ALRMAFDGETEEGNEIRDNIASLTGFGVGAFSGFTGSGGGVLFVPVMASVLNFP
 TMLAIGTSSVIVPVSAAGAAQYWMEGYVNFWAALAVVTGMLISSYVGAELSNKIGG
 5 ERVKRAFSVVLALVGAKMVLSSGLRLV

<SEQ ID No.:0144;PRT;Methanopyrus kandleri>
 LRSRRGFRALPPGPRPPRTPDDPARVIEDKIKECVRRSGHPRPGSRILVAMSGGKD
 SFAVAFGLKRLEVGTGGRVAPTVDGKKISAWDVVEEQAKILEIHAYLLEPESDVLEL
 10 KEEMNARKVCYACRTLRRIELGQLAEEKGFDYIALGHTLDDAAATVILSLTGAERLK
 LLWYTGTWRGGPRLIRPLVRCPEAVTKALAEELKVDVTMTEDVCPYAGGLRDEVEE
 FLDRLEREWIPHVKGNNVGTALRTLGRQCH

<SEQ ID No.:0145;PRT;Methanopyrus kandleri>
 15 VYVVGVDLAAKPGNPAGFAVWREGEIVCWSESSDDERVLEVCRKAELVFDAPLT
 ESDRPFRRRDEIFRRYAPVPLPTFFPGMRELSRRARSLVRRLELEVYETYPRAAERFI
 RLHGNPVDEHSRDAAICCAVGLAVLEGEAHVFGEPPKAALPKRELSVSVRALTAPP
 DV

<SEQ ID No.:0146;PRT;Methanopyrus kandleri>
 20 MPDKAEVFFDEGVLDFAVDVDEIVLDVGEEALAEALAHRRHMIVFQGDEGKAEAAAG
 VVTAGAADVLFDRDRPISVLVYTDLSLKEDTYARERYEEFRRVLEGFAEEANFEYEL
 EALTFSGSKRALGTTWDLMDLSDYLDPDAGRLVETVRGGGLVIFQTPPFDRWR
 NMWTAHFHKSLLVTPPYTLDHVGKRFNRFRIRKLKEHDGWVVDTDDEWTAPEPSED
 25 VDLEVEVKRRERPDLDPDDAVLPEELYRMCATEDQFRALIRFEELLESNGKTALIL
 TADRGRGKSALLGIAVAGAGVTTDVYDVVVTASEPENAVLFEFLLEALRELGVEYD
 VERDDKGNIVVETDDFVVEYERPSEASEIECDLMVVDEAASIHVPILERILDNNDKV
 VYSSTIHGYEGAGRGFSVRFLQNVKRKRDVRLIEFKMHEPIRYDSDDPIERWLFDTL
 LLDAEPADLDKEDLECVKEMRVEFEKPDRLRYWFEDEPEGEEELRQFIGIYVMAHYRN
 30 RPSDVMVLADAPHHEAYALKTETGKIVTALQVAREGTIPRDVITKMRRGYRPPGNVI
 PDLMVQHHDALDFPRMKGLRIVRIATHPDIMRHGLGSRALKELAKIAKKDYDWIGT
 GFGANEELTRFWLRNGFVPVHISPNNPVSGEYSVAVIRPISEEAEIINRANFEFRI
 KLADWLGETHRDLEPEVARLLFEPMSLLRYRPTLTEGQLRRLKKYADMVHTYEIAA
 DAVRELAKAYFLDTEDRPELSEEEELLITKCLQRWKWADVADVLGEEVPDLMRSL
 35 RDLVGLLYEEYKEDLQRSAAVEGIRKAVERLADKGLTGTVIVEVEEGEPKEVIIRREE
 RLEL

<SEQ ID No.:0147;PRT;Methanopyrus kandleri>
 40 LTRLLGGPGLTPRIMVGTSPFLGAGQFGHRALLYRRTFYHRPENIVALLEYCAEELG
 VTGVQALADPVIIGALRDADPDLDVAVVGLRNLEEELEMLENLNLRAVLLHASCVD
 GEDVGEVSAKLDEIRSRLDVPVGIATHRPDETLPWEDKKTADVVMVPLNPVGAFM
 GDQKAVEELLAETDRTVIAKKVLAAGSLPPEEGLPYAARYADAVAVGITGKKEAEET
 LRIAKRYFG

<SEQ ID No.:0148;PRT;Methanopyrus kandleri>
 45 VPVVHVGLFGHIDHGKTALAAQLTEKPSTAALDKHPPEEKERGITIDLGFSSEFELGDT
 VTLVDAPGHADLIRTVVAGAEIIDAAILVVADEGPQVQTGEHLVVLNHLGIDRGVIAL
 NKVDLVDEKTVERRIEEIKRVLQGTTLLEDAPIPVSAKIGEGIEDLKDALLEVLEPPNR
 DLDSPFRMPIDHAFHVKGAGTVVTGTVLTGRVEVGDELTLPIGKTVEVKSISQSFQK
 50 DKQEACAGDRVGIALRGIREEEIERGFQLAEEGSLRVTRYLDLKVEIDPLFPQSIGQK
 TMLHIHVGMRSVPARIVPHDDGFLDLSLRPGESSYLYAKLNEPVAVREGDRTILVKL

DLPPTTLRIAGSGLVEDTSKRETFKRVSRRRGRVTRADHMGKGLAVVDGLALNKEH
AERLVGEKVRTEGGVEGKIVDTHGTRGAVLVDFEGEVKTGERVVLERVRDVKIDL

<SEQ ID No.:0149;PRT;Methanopyrus kandleri>

5 LNPATAELWYLLVLAFSYGTAYLIVACEGPRYLLASGVVLLFINVLLWIHIFDTKARN
GSPPTGAEIVRVRRALKLSFAILGLQFTGIASIPGLLMAFTALRRKVIFYFMGITEFKAL
VYGTIALVTLPCVIALRKRHYHWVLMGMPIDTVVSVRNTFRRVCAIDAVLPIPIVVAY
VLLAKGGLGGEDIFTAAAVAGASSLNFNRAKVRYFFDEGW

<SEQ ID No.:0150;PRT;Methanopyrus kandleri>

10 VAKYEHMMMECLGKTPVRVIWKDGDVEVRAEGDPMIERCPLMRRREGFSKLTREAA
ERHVLNKVNEVGMFTPKRRIRSCRRYTPFGVSETLMTCLQHRILIDAAVIVSDCAGTV
VTDKPAIVQGLCGEISGIRDTDPIPEVVDRLEDSCSVLGRIDQREGVEIALEEGRRF
15 VAVTVADAGDAEAIREEFGDDVLIAAVHTTGTDDEEDAERLVQYCDIITGCASKAVRR
AAGRRYILKVGSRVVYGITPAGAEALWLNVRLLGNLKLVRHLG

<SEQ ID No.:0151;PRT;Methanopyrus kandleri>

20 VSSPDTPSCAHTSPPRHPPGDDVPLRLTPIGWVVERTDEEGLVKVRERYRKCLEGL
EGFSHWILWWGHEADRTVTRVRPVHGEVPELVGVFACRSPDRPNPVLTLCRILE
VRPNSGELRVSGLDARAGSPVDMKPYPGYPDEPDGEVSVPEWVEMVKRGHRPP
RTRGHRR

<SEQ ID No.:0152;PRT;Methanopyrus kandleri>

25 LTEDVYERIMEIARRRGFILPAFRIYGGARGFYDYGPLGALLKRKIEEKWREYYVHKE
GFMEIEAPNLLIGEVFEASGHVEHFIDPMTHCSECGEFFRADHLAEEELGVDAEGM
SPEELEDLIREHDLRCPECGGELAEVTEFNLMFDTNIGPKEGRTGYLRPETAQAIFIQ
FKDLRWARQKLPGVWQIGRAYRNEISPRQGVIRLREFTQAEAEVFFDPEEKEYP
GFERYADEVLKFYPIEEQRKENGEMLEMSVREAVEEGMVSQPIGYFLGLTKRMLNE
MGVPNEAIRSRQHLPEERAHYASDCWDVEVKLERFGWVEVVGIADRTDYDLKKHS
30 EHSGEDLRAFRELEPKIVYRPEPVMKELGPRFKSDAPKIAEALRRITAESSEDELKG
GLTVEVDGKEVEVPPECYEIVKEKVTGERFYPHVIEPSYGIDRILYCVLEHNFDPEEG
VFRFPAPLAPIEVGVFPLLKRSDMVEYARRVARMMLREEGFTVEYDDSGSIGRRYAR
ADEIGVPYCVTVDHETLEDDTVTIRDRDTTEQVRVEVDELADVLRGLIDGDLEFEEA
GDPV

<SEQ ID No.:0153;PRT;Methanopyrus kandleri>

35 MLTQVALDLTSLPKAIEIAEASVEAGIHVLEVGTPLIKAEGSRAIERLAEFFPERPIVAD
TKTMDVGALEAELSIXHGANLGCVLGAAPETIRSFVTRAHELCAALVDTIGVNPV
DVL SKLKGLEEFDPDYLLHAAIDEPITGEELLHKFGVDRCPARTAVAGGLTPRKIEEL
40 DGVDLVIVGGYITSSDPVKAAEAVVEAAGVEPYDFRPDEDQREALLGIRKHSTVGI
VVKDSERVSEVLNAAIRLVWRNEPSLRTVGDGDDSDLVPKFEGDGRDLTLILGAE
EFDREDLESIAKESVKTILVAEEHVLLKLYGVAEAVYEI

<SEQ ID No.:0154;PRT;Methanopyrus kandleri>

45 MELEIITEGRTPLKVPKTRGQPSARDPVFYNPAMQLSRDLTVSSLVQYGPKIVCDPL
AGVGARGIRIAVELSPEVVNLNDLNPRAVELIEENVRLNDVEDVCRIENRDANALMH
EDELAGRFDYVDIDPFGPPVPFLDAAVRTVRNRGVVGISATDVSALAGRYPRSARR
KYWVEVERVEFYQEVAIRALISYIVRTCAKYDLAFEPHIAFFQRHHVRVIGEIRRGAR
RADRALKRLGYLLHCRECGYTSEREFDRCPRCGSGSVRLGPLWLPDFADRERA
50 ERAASDARELGLEAAELLETVAKETGTNPWAYDIHRWASRLGLSRVPSLTSVLEG
LREEGFNAVRPHYSKRAVVKTASPEEFVAVLTVAGDSGCLHR

<SEQ ID No.:0155;PRT;Methanopyrus kandleri>
VSEVKRGVIVNYRMGRHTQDPRQCIIEFEGVESRSEAAQLIGKEVIWKHPETGKIVIR
GKVVDTHGNNGAVRVRFERGLPGQALGTEVTLK

5 <SEQ ID No.:0156;PRT;Methanopyrus kandleri>
LSKLAIEGGRPIREDPIPIAQPILGDEEARAVTEVLRSGQLAQGPRVEEFEREFAQFV
GCEHC VATSSGT TALQLALESAGLPGDLAIVPSFTFIATANAALHVGADVAFVDIDL
ETYCMDPRSLEEVVKLLKDRVLRPRTVAVIPVHLYGHPADMDPILEIAEEHDLIVIEDA
10 AQAHGA EYKGRRIGSLGDAACFSFYPTKNMTTGEGGAITDDGELAERARMLRSH
GERERYDHVELGYNFRMTDIAAAIGIVQLRRLEEFNERRRENARYYLKELADLEPLIE
LPTEKPWAKHVYHQFTIRINVEELSCTRDEF AEALRAEGVDCAVHYPTPLHRQP VYL
RRGYHATELPKSERAAETVLSIPVHPGLSEEDRQDVVEAVEKVVSAFSR

<SEQ ID No.:0157;PRT;Methanopyrus kandleri>
15 LPREKCPKCDGKGKIPVGETECPRCGGTGFVGDVDISEHFKGAAQHAVEGYDLAS
SRDVPCPKCQGGKGVITVYEECDRCGGTGYIVKCRECGKELDPDVEEDLCEECKRKI
KQIRKEKLPKVVLSPACGYEDVEEGELYKGKVS RVEKYGVFIELNDRTLGLLHRRD
MGDK EPQDFSIGDEVVKVTDVRPEDGEIDFTIEGIDPRPD RYREEVVEKELKRVLV
HDIDESKIGETVLIKGGIIHVQQTPGPTVFTLRDESGSIWMAAFEGPGIRAYPDIEAGD
20 YVRVIGEVTTHD GQLQVEILDMEKLVGTEKVEIKRAIDEALDREAEPEDLKPMVDS
EIIERLWPRMREVAKEIKRAVLEGRPVLRHHADADGISGGVALEEEAILPILRENNPDP
EAEYHFYKRFPNKAPIYTLEDASRD LNHALEDVHRYGHQVPLLVL LDIGCTEEDVPAI
EEMKAYGVDVLVIDHHYPGEAVGENPEDGLKEFPIDEHV KVVHVN PYAAGDGKNIP
AGVLAVEIARLINPEVEDRIKHLPAVACLG DHAESPEAEQYLEIAEEAGFDRKWLRI
25 ADSVDFQAFQLRHTPGRHLMNDVLGTTGDEHRHRLVENLYKQHKIACERQLEAA
LKG VKEYETDGVKVVTL DVEKHARKFEYPGP GKT CGLVHDLKVEEEGDDAKVVTIA
YGPDFAVIRATENLGINLNDIVSELEEMPEAAVEGGGHETAGSISFVEAHRNKVLK
ALVEKILRDATS

30 <SEQ ID No.:0158;PRT;Methanopyrus kandleri>
VRLRYLIPGILLAPSTTYLG YLAAKEVAYFMYHESVSIPDCELVIPKLGLRERINTTSP
DYG VYYEIMTPPPGKKGITVFYGHRTLFGSPFLHDELKRGDKVIVYWFGSKYVVV
YDKVVVSPDYVIDPDASNKDELWLVTCTPLSTARERLIVKCVRVG

35 <SEQ ID No.:0159;PRT;Methanopyrus kandleri>
LKL SLKSTILVMLGMCVAYSALVGSITIAQTGQSPGAPVGQPT EPTGQGKKPPVTISK
LVIEVQATGKGAQKPRESDIGISGAKVEDVKISGSRAYAKIVASNVSLEEGFPLMVNA
GWPFNMSECSYERISVSMELKANVNSAPETELSGVVVLADGRLVDADPKPARVND
NVPVWKIGVKDGRVTIDGRPYGPFPEIRYVMEYSRGAGGPGAGAE GGGAGGAAG
40 GAGVGGAGGAGAGGAVTAGQYKAGESLFLIAAVVLA AVVGLYLVYRGLSK

<SEQ ID No.:0160;PRT;Methanopyrus kandleri>
VIGAIVIGLIFLAAGGGAYYFFVYKPYVEQLEKLRAQKLKELNTYFTGPLAASPTRTKL
QQQILSAETPEQLQAIDVVGAA TVEWRRYLAKQIKMNQKKGRVELVTPEGPQLLTV
45 RDALNKIRMMGVDEL MKVQVKRPETVLIAIWADPNKTGPIKVGDRVTL SITNWALKKI
AKVKNKEAYKGNPQISGAIVRYIMLIKGGLPDNFKIDLVSASALETMYRTGSSDLALR
KVVFPAGLV TGRSYAVGGGTGV TYTLKNYPGLNTRVTS PHLSPVALVDLRDLVKAM
AVERARRGGGFIRQLMSIEAREGIRSWENLLVIVEIPKDAVQPKVLIASSVKGGIWILP
ET

50 <SEQ ID No.:0161;PRT;Methanopyrus kandleri>

- 5 VERWKISELITPACVVSLTNVVFAGFSLASIAGFPGAAARFIILSFIADSLDGFVARRT
GKESEFGMNLDSLADLVSFAPAVLVVTAGLVPAPMCYLLAVLMVCCGALRLARF
NAMCVDGYDPGEYYLGLPVPWVGTIASSLYFLTVDLGPSYLWYVLNTVILGTSALLM
ISSIKFPSLKRPHPAI AAGGLSSLVLLFSFLIPPDEIKRGGLEVVASVTITALLSWYMR
GVRGCFRGR
- 10 <SEQ ID No.:0162;PRT;Methanopyrus kandleri>
LMAPGWWKFVTPPAALGAALFPWSRPLSFLCLGTAAFLAFFFRNPPREPPSDPSLA
VSPADGRLLGYVMEAGEASDDELSSYLDDPITVSVFMSPLDVHVNRAPLDGRVVEA
EILKGRFRPAFRKDSATENNRAVLLFDGDPPFVRLVSGAVARRIDLYVQEGDEVN
KGEPIGMIRFGSRVDLAVPRSSVEELLVRKGD SVKAGETPVIRVKR
- 15 <SEQ ID No.:0163;PRT;Methanopyrus kandleri>
MSVWAFVRKALREPLRVGAPAPTRRETAEFMVRAAGVEEGDFVVDAGTGNGVVAI
AAAEMGCEVLAVDVPDPEMIDMARRNAEEYGVEDSIEFVADARELPELVDNVDVAVL
STVPVKTVPEPLEFLRSCATVLKTSGRFVQLTHWPGYFTKLLHHEVPLRVLEKYLK
VWHIVPGFVFCERV
- 20 <SEQ ID No.:0164;PRT;Methanopyrus kandleri>
VGVREVLRRLAAALRSGPEELDIGIYGAPNVGKTTLANRIAQDWEAEFFGQVSEVP
HETRESVRREVAIEVGSTTVKFNIVDTPGIATKV DYRK FLEYGLDVQEAQRAKEAT
RGVVEAIKLLKDIDGALVIDSTKDPLSQVNVTLIGNLEANDVPFLVVANKIDLEEADP
EAVRKAFSEYPVAVSAKTGENMAKLYEAMVREFTS
- 25 <SEQ ID No.:0165;PRT;Methanopyrus kandleri>
LTDGEVKVEVLAKSALERMSTEEVVEYVIEKTRGGSVIVLEGQLDPETLTQIIRETME
NVDLEEFTGVDIYVPPKAKTDKGLFDRLLGRQSEEGMTVISPADVLKDMKKGKDFI
TLKLG
- 30 <SEQ ID No.:0166;PRT;Methanopyrus kandleri>
MPHICIRCGEVYDKVTKEIIRRGCLKCGCRLFKRVSEDDGDNPATIVVERDGVYTINI
ENIDDVTVYKSGRFFIVLPEQKYGD
- 35 <SEQ ID No.:0167;PRT;Methanopyrus kandleri>
LKTTERPEL RVKILRAAAVSHEDISKEMDSYCAILGDPESIDDIVYEMRLSNFEIIDN
SIVKTRHGIVWRYGVVLIKSTPEITSLIKRIVSDTNLMSVVFKA KDG NFLIAGPDIVLK
KILSSARVKMKVKVTKRTRGIAFVETSTVVDAMPGFLKDIINTLLGIEEEVFSILVLDV
EDPEKFKIIDKGP NVYWRRIEEDKET
- 40 <SEQ ID No.:0168;PRT;Methanopyrus kandleri>
LPLWKRKKKEETKQEKKIEEEKKENNEKKASKLPTS IQEALSEEPEIEIDEGLEALGID
LGT MNTVVARPAEEEEFLVKQFPSVAVKKGTNRVLAIGEEARRMLGRTPEDIVAVR
PMRHGVIESLEYAKFIVQYAIELGSDNSPEEIERVAVGVPGDASEVEREAIEEATSDV
GMDKDNVIVINEALAAAGAGLP IAE PDGTMVIDIGAGSTDIAVISLGGITDQETMRVG
45 GDNIDQNIVDLVEEEFGVRIGIHEAERAKVEVGKVFTETEDIEDKEIEVVGKDIETNKP
KEITIDSELVAKAAEPV VQEII RAIESILDRLPPELVPGVYENTVLVGGTSLMRGLRARI
EEETDVPAELVDDPLTVVAKGAAIVAAEPK TLEPEIRLKALK
- 50 <SEQ ID No.:0169;PRT;Methanopyrus kandleri>
LRLRADLHHTTVYSDGHGTPLENVLAAEERGLETVALTDHGPASPDGLTDRSFRRRL
VAEAREAEKLCSVRVYVGVEANIVSISGEIDATPAMLSESDIVLAAIHNPRLILANPGS
AEELRRAIVHATIRCIESGEVHIIAHPVWILEQLRCYITAEAEIARVAADHNVGLELN

ARHLPRDFTLYQVAIRVGAPITFGSDAHAPEEVGRFKPLQKLARRLGIEPQDVHPEE
LGIV

<SEQ ID No.:0170;PRT;Methanopyrus kandleri>

5 LNPPELAAALPYSGCCDNPREFLKRLEVRSDPISLALVEIHGRVARKVQEWKPFVCPD
IRAAREFTREIVAKAKADFLAERAGGSEALDLCAGPGGDTLALAEHYDVKAVDREVP
RIEALKINARLHAGHAVEVIELDVMEAELEADADVHADPGRSGAKDPKRTEPPATELR
DMFSEVPHMIEVPPAVKPRPGTVVFSATGEVRSVCWTNLTEKVAAVIAETSAVLEG
10 LPRKPTEALEPEEVRYVIEQDPAVRKANLSWKLAEEELNVHPTVVAGEETVLASEDP
DLTVDHVIRVVEVGEEGDGPPTIRSLGVKLNPRRLAELRKTYKEYDIVYVTKAGVLA
GKVIYERE

<SEQ ID No.:0171;PRT;Methanopyrus kandleri>

15 LLEAAGAVLLGSAALLMVGR LGNRGFFLWLRTVGILGLLVGILSLALAALTGSAIAGL
VVGVITAAMMYLFSSRIVRIQMGAVDAEEFLRYKPEYADKLRRVQEMVSKLASKAGL
PEPELVVPEETGVGGYPNATGRRSKPTVGVTEGLLRHLDDDEIYGVLGHELAH
VKNRDTLVMVAAA VSTAIAYAFDPWLNAMYTEDWEDIAFLVLAGMLASLISTLLVA
AISRSREYLADEEGAKLSGNPMALEAEKIEAIVKSNPAPARSLSEVSTAHLWIENP
FRGGLRLFFSTHPPVEKRVRLRLARELQGP

<SEQ ID No.:0172;PRT;Methanopyrus kandleri>

20 VLRVLLIYPRSLRYFVIRAYREL PSTVKPDSPVLLASCD AVRATYTRLEG NVVTVEIG
AARNFQEVKASLAHELAHV LQFEHGVMPIGGLPPLRALALPEVGAEEVLQELPDV
AVRRLEMGLRRVTGCRTDDPLSELESLVLEPLRLAAERLDVPLYVPEVEPEHPEV
25 AKVKKRLLRRVRRIDPWSPLEVQRYLED AWA EVTVLATLSRGA

<SEQ ID No.:0173;PRT;Methanopyrus kandleri>

30 MALAKRIIPCLDVKDGRVVKGVFRGLRDAGDPAELAHHYRHHGADEIVFLDISASP
EGRRLMVDVVRRTAEKVFI PMTVGGGISDVEDFRALTAGADKVS VNTAAVENPELI
SEAADIFGSQC VVAIDAKREPLKPEHEHVADHIFSNDDGEYWFRVYVRGGREPVD
LDAITWAKRVEELGAGEILLTSIDADGTQEGYDIELTREV CNASIPVIASGGCGHPK
HMVEVFKEADADAALAASIFHYGKFTIEEVKEHLAERGVRVRQC

<SEQ ID No.:0174;PRT;Methanopyrus kandleri>

35 LDSIEKYLLVTRRMVNAGIPKDRALNTVQRTWGLTNREKKALYRIVWSRLESLLRAG
KRVPTPLLRGQDLVIDGYNVLVGLASLDAGEAVLCDDDVVRDLRMSPKLEEEVQT
ALEMLETYLRRVEPRSVRILFDAPVSGSGELAA RVERYLKDSLNV PVRASAVKGVD
EKLVRAGQVPVTS DSGIIDRV SAYHDAVREVA AEGIAVWIPPGPSEPKFVRALVPE
40 G

<SEQ ID No.:0175;PRT;Methanopyrus kandleri>

45 MVRRTSEEISERMEDYLEALYLLSRRGSGRHRVRISELSEYLEVSKPTALEMIRKLAD
RGLVEYERGLVKLTEKGREIGKEVWDRHREIASFLRFLGVDPKIAERDACAIEHSLH
PQSFRRRLRKL FHLLEATGEPTVREILDKVRGEEGSDGVRHRS

<SEQ ID No.:0176;PRT;Methanopyrus kandleri>

50 VKSWYGEVLETVD DAENFFERELRRMHKVELEEVPKVVFCAFDVIEGVKHEFEPEK
YLYKPGAIPAGA QALTDIMTDDHREDAVYIGEPGPEVSRDRWAGRVVSVLARLLP
ECVEVG LLEDVRELEGVRVRIGKFTLLNYVTGAALALSGAEVELEVQ

<SEQ ID No.:0177;PRT;Methanopyrus kandleri>

LDALLKICILNALAVVAFVAVLWAAFRYALPSWFIILVPGVLGSACVDYVMISVGVY
DGPWETAFASVVYAVAWWTGRPGPSGPGSR

<SEQ ID No.:0178;PRT;Methanopyrus kandleri>

5 VAEIKIHPLTRVEGHGEVIEVEDGEVTDVKFAVLAVRGFEKQVQGRPAEDVPYIVSRI
CGICQTAHHLAACKAVDACFDAEPPEGGHKIRWLMHIGNMIHSHALHFYFLAAPDY
VVGPDADPLQRNVV/KIVKDDPEVGKIAIELRRYGGQDIVEATGGKAIHPVTGIPGGVSS
PVDPESTRDRLNRAEEMIEMAYEGAKVGIEAIKETLEEYREKHDIDLLETGNIETYH
10 MGLVSDGDKHEFYDGEVKVVDPNGEVTRFEPQEYQDVIAERTIEYSYVKHPYLKD
VGYPDGIYRVGPGARLNVCSMKTERAQELYEEYVDEFGEVCVNYSLTNWARLVEL
VAACEEAKMLLEDDVITEEDECKEDYEPAKAGEGVGIVEAPRGTLIHHYVTDDEGRVK
EANLIVATTHNVPAIELALKETAKKLEDEIVELA

<SEQ ID No.:0179;PRT;Methanopyrus kandleri>

15 MGKATIATAQLSSCVGCHVSLDLHEKLLDLLEDAIEIEYCYVLVDQKEIPEHVNVAVI
EGSIRNEEDLEVAEELREAAIVAVGTACACGGVHGLANLYQLDDILEWVFKETPT
TDDEGETPEEVVPELFGYVRPLPEVIDVDYMLPGCPPKPESIAEVITAILEDREPELP
TTNLCEECPREKEDIPIEEIKFRTGQGRPDPAKCLLEQGYPCMGPATVAGCGAACP
20 SRGLSCRCNGPTKQALDQGAFLDAIASVSFETDQDVEEILEGLVDLPGLKLYMFS
MAASLLKGHRDVIFGSKGE

<SEQ ID No.:0180;PRT;Methanopyrus kandleri>

25 LIPLWWCAVFIYMAAIPVGLGALRIRSEGRKTILVGLLAGLSFVFMQVPIGHAHVNL
GPIGILLGPWSSAVAVFIVNLACALMGHGGITIVGLNTLINWGEAAGWALYRLLRER
LDYGAAAGIATFSVLATSSVPSFVMAVWINKPVLPLLLTLTTVWIVTAIEAVITASMV
KALAQMKPDWVRDL

<SEQ ID No.:0181;PRT;Methanopyrus kandleri>

30 VRFTEALEWSLTAETVLHRIHPWSKLVGLMTTIFASMLLYDPESIAILSIPYLIGCILAR
VPVRILARLSIPPMAFLGAVLLLMLPSGVPGREVLLYAVRGATDLLAVLVTTLTTPFN
ALWSALVVFPPTLAETGLIFHRSVYRAFELEGTLNIRIRGWRLRSINVLGSVIATL
LIRSHRSAELVQVSVEVRGATGRVRPLKRFEFTRIDFGWLTMVFCVSVALSGVV

<SEQ ID No.:0182;PRT;Methanopyrus kandleri>

35 LTHEYDPDGTCAVCGLSLRVKEGESVVVLGPNNGSGKTTLLHHILGLLTPTKGHIRVLG
HDLPDGVREVRKRIGVVFDVDDQLIMPTVLEDVAFGLVNRGMPREEAFERAREIL
ERLGIEDLEDPRPPQFLSGGQKRLVALAGAVAPEPDLLILDEPTSGLDLFRATRLFVRLI
RELKEELGFTMILTTFDVDIAAALAERVVIREGKTVAEGSPEDILTDVDLIRESGLKP
40 PEHVELLRRLGIENPPLDISEAEELLVAMLGEESRGNP

<SEQ ID No.:0183;PRT;Methanopyrus kandleri>

45 VETRKL RHPEVDLEGEVLLPVGSTEQHGHLPLGTDHLIAEALCREVSKRTGAPW
YPAIPYGVSRHHMGFPVTVSLRTKTMVALLTDVHRSFLHHGAAATLAVNGHGGNE
AALGTVAEEEEERFHWISWWKLAPIDELETDWGGHADELETSVMLYLHPELVGEERK
VDGRPTKPWEFPDYHEISETGKGDPRPATADKGRIFKTVERLV DIVEELREMY
G

<SEQ ID No.:0184;PRT;Methanopyrus kandleri>

50 VIWPDLTGLTARITGTTSGTHNVRAVRDRLWAGLMLCTNRRPVIALAYVEALKVL

<SEQ ID No.:0185;PRT;Methanopyrus kandleri>

MIRSLRTLKRAVVVNPLNPQSLRVLAVEVASDVVTAMAFSVRFSLLWIQCAPHGRD
DAVEGAAGYGESLKGRYW

<SEQ ID No.:0186;PRT;Methanopyrus kandleri>

5 MSGVMGIDEAGRPVFGPMVVAGVLAPKRELGLGARDSKELTRSARRRLRALMS
DERLRVDLRVWPWEIDEEGVAKAEFEAIRELVRRAMPDEVILDKPGNYSPERLRRE
LDLPEGINLIAEERADAKYEVVSAASIVAKTYRDWIVRLLELEYGEVGSYGPSDPRTV
DRLRRELRRGGELLKYFRRSWETYKRVESEVKQRKLEDF

<SEQ ID No.:0187;PRT;Methanopyrus kandleri>

10 LRIAGLRPVSCSDGLPGEVCAVLWTQGCPLRCPWCHNPETRDPNGGKKADVETIL
RDVEKYAVYLDALIVSGGEPLLPCEELKALARGARGLGLKVLDTSGFPPDRLGK
VISSFDRVALDLKAPLRDDEYMEATGGGMTASDFLKAARIARRRCDLELRITVHPWL
DDVPRVVEAVRKASPDVVVVQRYVGDKEVGIDPEELAEKLRESCENVVVRV

15 <SEQ ID No.:0188;PRT;Methanopyrus kandleri>

LNVAFEVKDRDVAGRLGRLEVNGRRLKTPALLPVVNPKNPTLDPREISKLGFDGVIT
NAYIIRKHEHLREQALEEGVHGLLGFDFVMTDSGSFQLAEYGDVEVSNEEIVRFQ
AKIGSDVGTILDVPTPPDAPRSRVERDLETTLKRAREAVELDEHPPLALTVQGSTYE
20 DLRRLLCAEKLAELPAAVYPVGGVPLLEEYRFVDVVRVLAACKSSLPPHRPVHLFG
CGHPLAIPLAVAMGCDLFDASAYAIYARSDRYMSILGTLKLEELETFCSCPACTRH
DPDDVREMEPRERTRVLATHNLYELRRVIETTRQAIVSGELWELAESVCRAHPRAW
AGMVELARRGGELERWCPAVKRSVFVCDEVSKGRPELRLYRRRLRDRFGELSGR
KVVKGISRPYAEIVEWLEPWELAFADWLGVPGLSWSYPCCHCLVEPSGDDEGE
25 DRRRGEEGR

<SEQ ID No.:0189;PRT;Methanopyrus kandleri>

VRTDGGVKRVAGAEFVLYKEGGSEFYVPDPERYSQDGLPTRDAPVAFAPNAAVNR
SVLVLFHRVRPVRRFQDVFVCGVGARAILHIEAEVWSVLSDVNPIACQIAMINVR
30 LGLPSEVRCMDAVAALSTFDFAVDLDVFGTPIFQAQAFRCVRDGYVHVTATDLE
SLYTPAARRKYLLEGPLPRRDTLDEVRAVVGALARLAASVDIGIEPMYCLVEPGVRI
RVGLECRRGRSRANETLDMLDYVDGVGPVWGGDLHDEDVVEEMLEELDCTGWS
EKHARDVRKSLEVT

35 <SEQ ID No.:0190;PRT;Methanopyrus kandleri>

VEKVREARIARTLATQHPDATKFVRVQEEPEEAVECLVELGAEYMVDFEGKLTPY
LQPIQVLMELYDAGVRVGEERFVIVRVPSATKENVLRQVQALLGVMEANSSELLKED
PDARGIFEVHPMTSSPEELVETVDRISYARRFASRELDVPLKAGNLRRIPLIEEVP
LDIRNLTGYVEGMREIGMDVSYLRVFIGRSDPALSYGHLPAVLACKLAIFEVYELSD
40 ELGVPMAPILGGGCLPFRGHIRPGMEEEFVEEYAGTATYTVQSGFRYDHDREKAVA
SIRINELAANDPLQLSGDDIEYLVLATAIFMKHYLSVFFRCIGTLNIVADMIPNTRDRL
ARKGPVGYARDIPEPDRVGAQCKDLGDVGRELYRELRRMRVEKLPELPRAIKFTGA
CYTVGMPPELIGTGRGLAEIEERLGEDALDAVISRLYPMLREDLQFAVEYTFLETAG
SVLPSSGVAMVNTDLEYCVEYLDLEPPSDFEYQNLVHTLEPYLRYVVSEGGVEEVN
45 PFVRDLLLEMGRMRGSLG

<SEQ ID No.:0191;PRT;Methanopyrus kandleri>

LKLTILASPLADRDVLRRAERLADRFNLEPRIVTDPEDVPDSPTVALVATGGTETIE
ALLERSSAVLLLHWSYNSLAAALEVGVSTLHVGRAEEAIRAFKRLVGTRILVVGK
50 CSWIRGPDPSDLPYLQTVEDLEDVKSVDPDGSGFEEKLRAHGIDPSELNRNFDLA
GKLHAVLSQYGANAITGDCFSLYEEFGAGSLSVLLRAGRALLRGRSRRPGHDPAN
ARAYPSLHRKRDRAGSLRDASRPLCLPVGVA

<SEQ ID No.:0192;PRT;Methanopyrus kandleri>

LTVREVYEEELREVVLEKLGKGEDPLPQILGQREVVKIQVLSALIAGRHLVIEGPPGIGKT
TLARAVADLLPPAEVVKGCPFHCHPKEPVCPLCRARDEDELETETIPGCERFVRIQG
5 SPDLTPEDLLGDIDPIAALEYGPTDPRAFTPGKLLRGNRGVVFDEINRCPEKLQNAL
LQVLEEQRATIAGYEVDPANFVMIATMNPHEYAGTEELSEVLLDRFDTVKMTYPKS
KETEKRIVVERGEDFGVKVPEYVLEFIVDLVRATRHDHDDIERPASVRATIGLYERAQT
HAALQGRSKVELQDVIEVAPSVLRKRIKLSPRVQHVKSEEDVIKEIIQEVLEGYGKTE
VPDTDGIPGKSKPDEGASTGAPEGRRRSRRWRPRRTQEHDPGARLGSEKRSRSD
10 SRTVSRSESQKTSATDSAADGEVLDDEYHRRLLFRALTKEQKRYVEGEPEYVFA
ARVLRQLLNRGIEYIRPDQLAESLVTSAAYVKGYGRRFIEEITGWSYDEIASQQHD
YSLIDELEEEIQRRLLEILQKLGFRPSYQGGVSLTLKGRELAAFSALIEELEAFEGTEF
GHHAARKLSERGTGSRYSREYRRGDPYANLDVRGSLRTAVRRGRREILPEDLRS
FDREEEVCLDIVYVIDTSGSMSGDRIDAAKRAAIALAHFSVKAGDRVGVGFNTKAEI
15 VVDITSDVEEITKVMMSLKPGGATDIGDAIRVGTELFRRCGRPDRDWHMILLTDGVPT
KGEPPETKALSEATAASRMGVTISTIGIKLPEEGIRLIEHAGISGGRSHHITDPEELT
LVTLNEYRRAKGMGP

<SEQ ID No.:0193;PRT;Methanopyrus kandleri>

20 MFPSVPSLRISPGVGPGRRVNPVMEIVKHYEDHPIMKKLKVRDPFRALIAIISQRT
RDDVTDRAERFLRKFKTPKDVAEVNLKDLVETLRDAGLYRQKAKMIKECCERILAD
GLDLEEIVQKPTTEEARRELMRLPGVGPKTADVLLFAGGHDVCPVDTHVARVSRRL
GLTDSKEYFEVQEAVHEMVPGEGERGKAHLALIQFGREICRPRKPQCELCFVRRFCP
YGGEQA

<SEQ ID No.:0194;PRT;Methanopyrus kandleri>

25 MGRIIRIPVHGFVELQGAEEVLDSPVQRLRRVRQLGLAELVYPGATHTRLEHSLG
VKYLCDRVMEIHWEELKRNVPDVGKFSRSYIEEVGLAGLLHDVGHPPFSHVPEPL
LEEELGVDHEDIGRAVAKVVLERADAMDVEVTLEVAFGPGDGWTGVLHSVIAGNLG
30 VDRLDYLMRDSLHASVEYGRIELDRLHLELGDPPVVHEKGLEAAESVLISRYHMY
RAVYFHKTCRAGDAMLLWAMHVAEDGDLDLRIFDPDRLSRSEDALSAFQSMDDS
ALLRALEENPESREFVEVLKNRRLKYCAVEYQAAVEPRHGELFKVAVETSEEHLGE
SFGVLLDSSKVVPYDPSSDEVIVRTRNGDVPLSEVSDIVATLKERTLSEIPTVRVYVR
PETRDEDESRRRIVEHVKSALPPA

<SEQ ID No.:0195;PRT;Methanopyrus kandleri>

35 LLSGDETLTVYLARVLSCELPFRVSTPEEARRIAEEKILSGEIEPPLEFFGLRRDAVNEV
LAVTDGPAGENVAPVGLRVRGDSIVNLYPGSRTYENFVRTEELTACIVPDPIRFLK
40 ALSKELAIETVGDGTKVAEGTRAYLELEAKEIHEGKPLTAELQVVGWGLLHPRPRAL
VRGESALLEALVELTRIHLDHVDACKRALEVVKRTIWSEEYQWAVEKVERELRG
KEDGPDHQDTSPRIRATGG

<SEQ ID No.:0196;PRT;Methanopyrus kandleri>

45 LVNEPERIAVSLTLGALLEVSSWPKPGNVHRTDRDTRFEHFLASAVAAQPVLR
VAEMATRGERVPLGRYLYEAVRHMSAHTGGNTNLGILLLDVLLASALARASLDPS
DVRREALKLAKETEERDAYLYRAIRLAGAGGMRRIRGSRAPDVSRPEDVLEKGIT
MYEALQAAHRDAVAEDWVRGLERSLRIGLRVIELREEYDINEAVVRTFLEELATRP
DTLIWRKHGFRVALRVSEAAQEILRIAGDRPVTETRALYELDRELHEDGINPGSTADL
LAAGVGYACYLGMRP

50 <SEQ ID No.:0197;PRT;Methanopyrus kandleri>

VAEIVVRFDHRVIEKIPRRPHVPFELIGFIFSGWVLPSSILMLFDRPLGQVLEALVL
SMVSSEILKVVVGRPRPQREG RTPWGYSFPSTHTARVASLIPVFWKLSSNLGIVVV
VVAIIVASRVLSRAHYP SDVVAGFLLGYVVGWVFIW

5 <SEQ ID No.:0198;PRT;Methanopyrus kandleri>
LKHSPWGRDGLYPTVRMRRYRKSEAIRDLVAETEV RPDDL IYPIFVREDGKTHEIPS
MPGQRYHSVETAVETVRELLDLGLRAFILFGIPREKDPEGRVAADPEGIVQRTVRAL
KEEYGDDIVVTDVCLCQYTTTHGHCGLVDEDTGKVLNDPTLEVLAEVALSHAEAGA
DIVAPSDMMMDGRVKVIREALESEG FDDVLIMSYAAKYHSAFYGPFRDAADSAPEFG
10 DRSTYQMDPRCFRQAI RELELDAEEGADILMIKPAMPYLDVVREARRRFDHPIAAYQ
VSGEYAMIKAAAEAGYVDYRTAVLES LTCIKRAGADLILTYFAPEVVRWLKS

<SEQ ID No.:0199;PRT;Methanopyrus kandleri>
MRTVGYNP SLPHGECFKLIRGRKESRETA FGVDVFKEAFIKWSEGWARLKEFDRE
15 EMLSAYSSFFRSRFGVNFKERNVELLNLIYRIAVEYRNILDVGEKTLTGKLR TYFIPV
IMVIMVKQFYGRIKRKEAMKYVRDALQFYKTAYELSGREEGFEEILVGSLLPIEVRKG
EKLPKFFEEESFKDSTIRKFLGLESESGSVKFGLGCVFIPSWQFRELRAEIKFGKGFG
RDGGYVEYVVRHAGTFRECLLMVPQLRLVLVENADTPDKRVFLPFDMLELVPDPDA
ARMKLESLAVKLTRPS

20 <SEQ ID No.:0200;PRT;Methanopyrus kandleri>
MEDLVCVGITHKEAEVEELEKARFESDEAVRDIVESFGLSGCVLLQTCNRVEVYAS
GARDRAEELGDLIHDDAWVKRGSEAVRHLFRVACGLESM MVGEQEILRQVKKAYD
RAARLGTLD EALKIVFRRAINLGKRAREETRIS EGAVSIGSA AVELAERELGSLHDKT
25 VLVVGAGEMGKTVAKSLVDRGVR AVLVANRTYERAVELARDLGGEAVRFDELVDH
LARSDVVVSATAAPHPVIHVDDVREALRKRDRRSPILI IDIANPRDVEEGVENIEDVEV
RTIDDLRVIARENLERRRKEIPKVEKLIEEELSTVEEELEKLKERRLVADVAKSLHEIK
DRELERALRRLKTGDPENVLQDFAEAYTKRLINVLTS AIMELPDEYRRAACRALRRA
SELANG

30 <SEQ ID No.:0201;PRT;Methanopyrus kandleri>
VSKSEAMAHLSVMEATYNVKIKNKEEAAEAIAEKAMEFGVEPIHICTALNTWLARMM
SEGEIEEGDEIEIPRELIEGIEVKG

35 <SEQ ID No.:0202;PRT;Methanopyrus kandleri>
MPRLCFVLAESELEFIPPKLRGHQHVVRWAKRRGKKPGEC LLIA SKHHVAMRDKRL
PERDRRGRPDIVHVTLLHVL DSPASRENALDVYVHTRHDRV IWFVRGDVRLPRDQYR
FIGLMEQVLKEGQAPPDSDEPLIEVL DVSVWDVLEANEV NVLLSERGD LIEPVGYMA
GLLDAGVERIGVVVG GFKGDFSEEFYDRADDV VRIYDEPLDAWTVAARIVTAFELA
40 AGILG

<SEQ ID No.:0203;PRT;Methanopyrus kandleri>
VTSLVITDIDGTITGDDRAVHLKCIRYLRELQKRGIPVGIATGNTLCYSRSAATLLGFE
GPLIAENG GIVAVDDEEISTVPEEDIELIQEAYRELRRRLGVRRTEPPGLRRTEVAIYR
45 DVPIEEVERVLDGLGYSGRIEVDTGFAYHLKSKRV DKGKGLLVICERLGIDPDDVV
AIGDGDNDAPLLKAAGLG VAPANATENVKRIADVVLDAENGEGVATFLRKLLEEVD A

<SEQ ID No.:0204;PRT;Methanopyrus kandleri>
LKLYPLVRKVLKLLSSADSIGIMADTDADGVSGAATLCEAFGVAEDDVWFPSGGFY
50 GVPKDALRDMLEDYDVVVTVDLTPPPFPEARDRVVIDHHPTDSHYPMTVNPYEIP
ALPTHTSASALVGMLAHRTGGLNRPWVPLIGAAGDGM EGGAVYETLASMTDPGYL
VPSRGRNLTP LQDAAATVNAARRVKYDVGAREALKV LMSADSPYDV TESH LQRYR

KRVRKHRAIWSGEAERTAHIVEGVGYAEIHTEVDVEGLVARDLVDRNLNLRCSVVVN
LARKPCGLYKASGRSQGFVNELMVKMARWLEGSKAGGHPNAAALHFSDGDPRE
AFNRALDLLQP

5 <SEQ ID No.:0205;PRT;Methanopyrus kandleri>
VKFVVITGGVVSIGIGKITTASIGRILRARELEVTAVKIDPYINVDAGTMNPFQHGVEF
VTEDGVETDLDLGHYERFMDVTLSGAHNITTGKIYQRVIEKERRGDYLGTVQVIPHI
TDEIKSWIREVGKASGADVVLVEIGGTVDIEGMPFYEAVRQLQLEEGRENVMFVH
10 LTYVPYLEHVHELKTKPTQHSVKELRSLGIQPDIVCERCERPLDDGVKRKIALHTNP
REAVIDAHDVDLVYKVPLLLERQGGFDYICERLGLDADEPDYSDWLDVFVTRIEEADD
EIRIAVVGKYVDLPDAYISIREALVHAGAHVGVGVDAWVDSEALEAGDSEAWEEVK
DADGVLVPGGFGKRGVEGKIEAVRYARENDVPFLGICLGFQLVVVEYARSVLGLD
15 AHSTEFNPDTDHPVVDLLPEQRGVVKRKGGMRLGAEPVVLEEGSLLRRLYDDREIV
LERHRHRYEVNPSYVRELEDHGLRFSGHSPDGRMEALELPDHPYFVGTQFHPEFK
SRPGDPSPPFVGLIKAAAGQGP

<SEQ ID No.:0206;PRT;Methanopyrus kandleri>
LYSMRVVIEETDVTIRADSKESVSSAAKAVKLHRSELDRYVAKDPAFVTAKVPVRTL
EGAPEVAKLMSRAAEPFGVGPMMAVAGAI AELARASEPTVIVDNGGDVQVRARR
20 SVVVGlyVSDDHPLSGRIGFEIEGVLGVCTSSGKFGHSYSAGKADAVTVFAERASL
ADAAATAICNLTSGDDPEAAVQRALEFADDFTGDLIEAAVVIRGDFVGISGRPPKIVS
LRGGRIKPARLEPTI

<SEQ ID No.:0207;PRT;Methanopyrus kandleri>
25 LPEIVLVGRSNVGKSSLIRAITRGAADVVRVGKRPVTRKPVFHELDGELVLVDMPGF
GMSGVPRRYQERVKDLIVRYLEEKDNLFAIHVVDKALPEIAERWERRGEIPIDRE
MFQFLNEVGLDPIVAANKIDKIKPIEFEEHMDAVAEALGLFPPWRQWLDTLFPISAKT
GEGLVFLEALQERVRKAGYPEFARFFRTK

30 <SEQ ID No.:0208;PRT;Methanopyrus kandleri>
LGKKMEKKRAEMPPARAGILSFWDEEAPGIKIDPDYILYACFAVAVLLIIAHTMAAV

<SEQ ID No.:0209;PRT;Methanopyrus kandleri>
35 VYRDTA AFLVEGLDEYLEDMEPSDVAEAVLKAYFEDVERVEEDDTIIFECRTSFPML
RFIHDYAEHPEFEKYVKPEGDIEKRSEVLEGEN

<SEQ ID No.:0210;PRT;Methanopyrus kandleri>
MSDTETIETPSGERPLLPPKARLTFSRTMPAALPETVEHTVRLYITELEHVSSNESLR
IEEKKDGTNVRVVLGRVLESELGEPVIAHTRSWVRVEEVEEYVQSVLDPSEHSLTIV
40 EGELLPLSLFGTSVFELWNETLDYIDYHVRLMSRYTLNPRRKRVPRAWLGKLFDR
SKVRRHVRTLTYTIQRRLPDVKLADDDEFQRLHEEIERLTAIAHDKDYVPEDAVEILRD
ILSVLDDLAAYEPEDSEPVYYYELDMYDGEITIQKPKIRQYELLADMIDGDRIKPVPS
TLCDLGEAEQVARELMNRVEEEELEGLVIKPEKEVPGVPHARKVRAEWYLRGMKL
45 GSRLSLKGFAGAAEKYARNEVRRALAAIETSYLYRALEALAEGDLRRASRIVKEAEE
VTD RMSEWDDPTV

<SEQ ID No.:0211;PRT;Methanopyrus kandleri>
LTRVERLEELL SHA VSQRSGRIRVVTVDDELRLDEEVRRIVHRAAELDHALVESAP
EHVLRGERAQEVARALDDILRSVLELVGVEEETERDLDDLFKDSVLVVVRGRERKA
50 LRELVDAPIVQTGGPLVPEDYRKVNPNLPEKLPEGLVKSVERARRELEEYIRKSGAK
RIVLVREEDDRVGEVLEEEELPEVAEELGVDHEVIVVPDFTELSPS DLLSGRTK

<SEQ ID No.:0212;PRT;Methanopyrus kandleri>

LVLERIGRFVWKFTAAGVYVTNLPWIVVKLLKEGPKRSAKFTSQLIRTAEEASASKF
QTVMEMVREGQVLLPELPQVPFKDIEIRGKRIAAAPRMPWDVPVLVLQFSLLATVVF
VILEEIVAPPVMLWEALAVISAFVTAFLSLGWLRRVSPSEDIHWLPYWHSTLIILGSSVL
5 SAILTNVPPVALVLPLEGLVPGFIVFGLPALGVAAATVWVRRKFHRTWTFGVVLR
VQEGGSVEVVVGHDIANTLPGEYIVEGSGSEGTPVLVEVEHSGFSLTGARPVRILK
EGWW

<SEQ ID No.:0213;PRT;Methanopyrus kandleri>

VRVWPLGFESLGVRSMATLIETPDVTVLVDPGVSIPPKRYNLPPSEEEWEALEEVRE
10 SIQRAADSADVVTISHYHYDHTPFTDRKYEACDLETAKELYRDKLILMKHPTENINR
SQAGRARALIEGLDELGVDFADGKRFEFGETVLEFSQPLPHGPEGTRLGYVLGL
RITHRDHVIVHASDVQGPVYGPALEWILERDPDLVLISGPPTYLLGFRFSSDNLEKAV
15 KNLRKLASRSGQIILDHLLRDKNYRDRLESEVYEEESDNVASAAEVLGKEERLLEAYR
DELSGEE

<SEQ ID No.:0214;PRT;Methanopyrus kandleri>

LSGVKRVEFDARLLDSLLEASDKNHPDEFFAMLGGSIDAETITIDSLIVVPFEASDSG
20 AIFDLLSVHTCDVIGTFHSHPHYGDPVPSEDDLMLFKRLGAVHAIAYPYTPDRVEFY
DKSGRNITPVVEVRYTADDEEANNR

<SEQ ID No.:0215;PRT;Methanopyrus kandleri>

MDLAGGWHVGAAFVTVATLTTVLLALLTYSIGVVGRWIKAPIATTLGAAIIGAGVGLF
LLAPMLSDIPKVAGLEKNGYLTVELSTAPSDLPKALEAVKKYRGKPVGRYLELEVA
25 MSEPVPSDRRRWFESEKVPKVFPGVKDVRFSPTKMVVRMDLKSVPSPKVSQLADE
LSGWITYTSGFVVVGVTATIDVEVPPSEYADLKGEIREIADLRVIYDPTKAAQRRIAR
MLPSPRTTVIASTLAFAGIAVIGWYGISHIIGPLTSPLRRSAEGRRLVRREKGRIRRET
PGLPPRGKR

<SEQ ID No.:0216;PRT;Methanopyrus kandleri>

30 LIEKVLADLNRVEGVHGSLLVSSDGLIAEAVPPDIDSEIVGAIATTVYGSGERVVDEM
NLGDLEQMLIEATHGKVMIVDVGEDATLVLVVEPDANLGLIRLRAREAAEEIAKQL

<SEQ ID No.:0217;PRT;Methanopyrus kandleri>

35 VIRRALDVIQEQLDVEKLVVEARKDLTSALNRVTEYFGLEKLVVLDDSGKPIGIVGDG
RMEGGLINAVYTIRESLGDVDITLVTSEDSTNYLALCLDEYVVVCESKMTLSADIFM
LKNDLGKVIDAAVSGQRVKSEIPFVVIDEHGLVILSNVDRCEEVGALISQLYRFVKDH
VEGSIEWIKMTTGENKTLAVKPHNDFLIAFVVESDVEDADDACEETVKTLEKVERAV
40 AGSPSPPAEKGEGLT

<SEQ ID No.:0218;PRT;Methanopyrus kandleri>

LAEAEPESEACRVVCMASGKGGTGKTTVTANLGTALAEALGAETYILDADIAMANLG
LILRMEDAPVTLHDVLAGEADIEEAIYEGPHGVKVIPAGISLEGIRKANPDRLRDVVEH
45 IIDRADFLLIDAPAGLGRDAITALSASTESLLVNPETASITDALKVKAVAERVDTQITG
AVVNRVTCKDKTELTKEEVEKILETPVMVEVPEDPEVRRAAAFGEVPPVVRSPKSAAA
QAFKKLAAELVGIEYEVPPDKEGVLSKVIKGLFGRR

<SEQ ID No.:0219;PRT;Methanopyrus kandleri>

50 MKVSRRHPISEKDLQEVLEELRVSSGSLSGEVLTGLVEVAYVKDDDIERLLIKDGKV
MAFERHEGWFPPTIHALLQLDEGNYGHVVIVDMGAVKPVASGADIMVPGIVEVRGEF
EEGDGVVIDERNRRPLAVGIALMSAREIEESERGRAVRNVHHVGDRLWEARF

<SEQ ID No.:0220;PRT;Methanopyrus kandleri>
LRPHDCLRDFLDDIVIVELKTGKTLRGRLVSFDGHLNLVLDDCVEIDEDSEVRLGRVL
IRGDSVTLISPAEVG

5 <SEQ ID No.:0221;PRT;Methanopyrus kandleri>
LAKGTPSFGKRNKTKTHVRCRRCGRRAYHVRKGYCAACGFGRRRIRRYSWQNK
KVNRRRR

10 <SEQ ID No.:0222;PRT;Methanopyrus kandleri>
MARDGRRKSPVDVRIIVEGAADAETISKVIQRMALGGEYNITVTSIIPTTHAHIAARRTA
EGADLVLIATDADKPGRKLAKKFQEELRGVVGRVERVKMPIGHDVEHVDLEIVEKEL
RSALVRAGLKSRLDIKELREEIKELQEEIEEKEELIEELEEKESELEELRERLKEIEKEK
ALLEEERDRLLDEVERLRDRLEEELEEELESADHLRIMDLESVCEEAEELSPEDVEPEV
LEELGEELEIPIVVGSTRIAAPSREDAVRVLKIYKLARKVVDGEGEEENETTPGDPEV

15 <SEQ ID No.:0223;PRT;Methanopyrus kandleri>
LKSDDFLEKVEKLEELAEGEPCALVRRQNVEWITHFPGLAFHADFESEYTLVVHR
MDSRAVREWPIPETVEVITHDEANRLTPARAVIDDESAARKVPCYRVKNVNEDVTRA
RLSKSKSELRFIEELVEATERILVKVLPPEDESAEVAASDLIREATIRGFQTAFDPIVAY
20 DEGAGVPHHRPSPEEKTWTKCALVDYGIKMVYCTDITRTVVSENEAGDVLEVVNNA
LEEALRELQAGVNPKELEELRGWMEDEAPGFEPHSLGHHVGVTVHEGRLMGRL
PEGAVITVEPGLYSDEFGRVEEMVVVGKRKCRTLTKLPRVWER

25 <SEQ ID No.:0224;PRT;Methanopyrus kandleri>
MPNANQASAGVGALKEVLPGIRALGDLEAAEKVVKRCSGGSTVMVCVIGSTEISRV
PGISAAGKTPESTFHTPAGDVELIYYDRIINAEVQPQNPVGAPSPAVITKAVNLAISIP
FLTVDAGAAVKPACPYIDLGGGEVARDFREGLPALSEETYDRLLEFGKTLGKELTRDVD
FLTVGESVPGGTTTAMAVMTALGYETSEKFASSSHDSPHDIKERVVKEGLEAQQGVE
PGDLDAHEAIRRFQDPMMPAVVGIYGSRTPVLLAGGTQMAPILAYLAEQGQDPER
30 VFGVTTKYVVEDESDIESLFRQVGDYVLFSAADPGFSESKFRGFRLYEEGYVKEGV
GAGGAQVAAALKTKGEITPKDVLRECERVYERWMDKF

35 <SEQ ID No.:0225;PRT;Methanopyrus kandleri>
MSTDEWLRELERALKRAEDTDMILNPALGIGVVVLGPLASASVSVIATVCVATASGA
SVVSAGGTALTGTVVLF AAF LAVNAALFYILIRRRNKHFERSSSELFRIVSEILYRTECI
SKSCYLAIFRKVKDIEELGHLDEVLWIFLGTITFGVAYLYVAYRLMRDFYLHEARESAI
ASLLADELDMCISFFRKIPYRNFGIHLIVFFPILYPYLYILIKDPNNHFLEHRRFERT
LVEKLFS

40 <SEQ ID No.:0226;PRT;Methanopyrus kandleri>
LKMTRREFVRKLVRRIHKEAETLDRDVTIMHVCGSHERTIVEHGLRSLLPENVRVLC
GPGCPVCVTTTGELAAAIKAAEDGMVVCAGFDVYRVPTPVGSLSSCDGDVRVVQS
VRKAEIEAISED RDVLYLAVGFETTAPTTAAVLLDDPPSNFYVLSAHLIPPAMEWLL
ESGECRLDAFICPGHVSTIIGTGPYESVARELPCVVAGFEPEDVLI AVLACLKMLRRG
45 RVGVTNEYLRAVEDRGNPVAKELMERAFAFEPEDRPWRGFPTIPESALKLREDLADH
DAIEIGIRPDYTLGHDESCICDRILRGLAEPRDCPLFGTKCTPTDPVGPCMVSEEGP
CFIEYRFGGG

50 <SEQ ID No.:0227;PRT;Methanopyrus kandleri>
VCLAIPGRIVELDGNRAVVDGFGVVRQEVDSLLEDVEEGDWVIVHTGFAIQKLDEEE
ARASLEIWEEVLKHIEEELENDTSGVREKARPSNP

<SEQ ID No.:0228;PRT;Methanopyrus kandleri>

VPWEEIEHTADAAFRVWADTPEDLLVEAAKALFDLITDLDAVEPEEEVEIEAEGGDL
VELLHDWLEEIHFREIDGMLFSDFEVKELKKEEGWKVRGVARGEPYDPDRHPFHT
EVKAVTYHNMKVEREDGRWVAEYVVDL

5

<SEQ ID No.:0229;PRT;Methanopyrus kandleri>

LNLDYRNIVRETERKYINVNPIQRGGVLTPEARKALLEFGDGYSVCDFCEGLLHEIE
KPPIRQFHEDLAFLGMDVVRITAGARYAKEAVMSALCEECDVVADSLAHYTTFFV
AAEKAGATVREVPNTGHPEYKVKVDEYARVIDEVEDERGDPPALALLTHVDSEYGN
LADAEKFKICRKKGVPALLNCAITMGRMDLSNLSPKPDFMVGSGHKGMAACAPC
GVLAMREEWEEEVLRGSSLRGDVSGREWPHKEVEMLGCTVMGAPIVTMMASFPH
VVERVKRWKEEVRKTRWVFKEMERIEGVRQLGERPKRHDLVKFETPGFHEVAEDH
PRRGYFLYEELKRGVIGIQPGQTETIKASVYGLTDEQVEHVRAFHEIAEEYGLEV
S

10

15

<SEQ ID No.:0230;PRT;Methanopyrus kandleri>

VRMVVLFSGGPDSSLLAALACDEYDPEKIILATYDNGVLIGVEKAGINYSQVKRATDA
EVEWRIFDIHGPFHRWGLRGLERRILRFGWNPVCLDCKFCMLFHALEKLEPDVIVT
GDRESRKYPEQTPEAKAFWEEMCGEYGCYFTPLWDWKKRGVYEELARRRVSVR
GSEPKCMLAGSWKKPVSEEKVERYLEGLRKRLGLRSTP

20

<SEQ ID No.:0231;PRT;Methanopyrus kandleri>

MAESVKEVIDLTEIPFQPMDRQEIHQLETVLLVATLFRPKVLEMIHEQKFLTWVDSLA
VAASALARQKAGYTISEIAEELGRTEATIRKHLQGETKAGELVLETYEMLKSGELQIV
TGVEDIKEKLRVEEEKVERLKSEMEEVSTTISRVEGLRECCTKMEDALEEELEGLAE
KLEELKE

25

<SEQ ID No.:0232;PRT;Methanopyrus kandleri>

LFVKFDSHVHLDVRCEDDMKTMSLAGIRYVLTLAHDPMPFRTAEALLGHWEAVEST
AETAVDYLIDAKVGLGVHPRAIPDEGLELALEHLESKLSDLDAVGEIGLEEATDEEVK
VFREQDLAATEDVPVVVHTPRSDPNVISKIEVARSDSLHPDLIVIDHLNEQYVDA
VLAEGFNAGITVQPGKATVEEAVEIVTNRAEHADRILINSRASNSNLAVAEVAFAE
LEKRGFDATEAVVRDNALQLF

30

35

<SEQ ID No.:0233;PRT;Methanopyrus kandleri>

VRLAFIGGTGHQGFGLALRLAAAGHHVIIGSREEERAVKAAEEAEEILAEHGYEDVT
VEGRENSDAAAEAEVFLTVPFFAVIDTVKAIRDSLDEDAIVVDVTVPLETAVGGKPT
RLIRPWAGSAAETVQSLVNNPVVSAFENVSAESLRDLEKEVKCDVVVCSDHEDAKR
TVMELAEIIPGVRAIDGGPLENARIVESITALLISLNMRYGKEDVGIRFTNL

40

<SEQ ID No.:0234;PRT;Methanopyrus kandleri>

LRDFLRCVEDDLVVVKEELSPEYEVPAVLQELDRPVVFEGVEGYDIPLVGNLCCSR
EYLVRLGAESWDDVLRKLAEAMDSPKEPRKERSPSFLEAERGPEFLKEFPMCRF
YRTDGGPYLTASLVVAVEPEEGIPNASVHRMMYLGDGKFAVRVVRHLYRYYEKA
DHDLPVAVCLGVDPRTMFACCARVPYEVSELDVAAAFWEDLRVYEVDYGIPVPAES
EIVMVGRLTPERAPEGPFVDVTRTLDERRREPVEVEKVYTREDPYHPILPGGEEH
RIMMGPAEATVLAHVS RVSEVVKVRLTPGGGRWLHAVVSIRKRTEGEAVNAGLA
ALAAHPSLKHVVVDEDDVDPDDPEQVEYALATRFQADRDHLHVVRGLGSTLDPSAEE
GIMAKAVFDATAPVEKRERFEVVEVPVSDRVRRILDELP

45

50

<SEQ ID No.:0235;PRT;Methanopyrus kandleri>

LRDRGHVSVVAGGQWGDEGKGKIVAYLAVQDEPEVIARAGVGPNAUGHTVRVNGE
DYGLRQIPCGFPHEEAELAIGPGVLVNPEVLLDEVERLSRFRVDDRLLIVDERCAIIEP
KHIEAERASKHLSDEIDTTGTGCGPANADRALKAKLARDVDELSEFLGDVPGLVNE
AIDAGEDVLIETGQGFGLSLYHGIDYPYVTSKDTTASAFASDVGVGPTRIDDVYVVK
5 AYATRVGEGPFPTELSREEVIEKFGEIELEVERGTVTGRPRRIGEFDFEMAKRACVI
NGATQVAITCIDRRFPDAAEAETWHELPTEAKKFVEKVEEAVGVPVTIVSTGPELEH
TVDLR

<SEQ ID No.:0236;PRT;Methanopyrus kandleri>

10 MGRLVDSTAVTVAALLALIVPVNAHVYVVVNVPDQVHTKYHWMRVFVTAASLDRE
WAGGNAASVIPIAVQGKLDKLTQNLMSSEVGPSSVLTYPATHPGWERLPDDLEA
ACVRLVEVAMNSGVPVKFLLCLDSAGFIPGLELAPIVAKQQGAVVWGNPLTYMTH
FDVPVLTLDDEYLRNPEYDFSDLSIRALAVVQPLAKPEGPYKSQPFDPITLAADVQFAC
MRPALVAFVTVGGSLNVDTLKQDVRDRFLSAYGKELKGLDDVEYVVSFGSVLLGSP
15 KFDVGVACFPFHGLPGFLAANRMLVSMHLHGEASPLVVDPTGSLSAYYGDQHSV
TVKWLSPDVSNSLNLKNQKFAAGIVVFKEALGQNFQLSLNSECNSFLICADPNIA
QRVDVYATPNGFPKFRAVIAFRDPAGAIMAYLFAASGVELGRAVWACWELEQLR
GYVDVSPGYLLVGDPFYPFEGPFYPLPNLPEGKDLNVKLPRAFLVPADKYRLVPLI
FPAFVTGLTKIPKDPYSTVLADGLNFVAKRLGPNRYSVSGILIHPSGIRNAYVLPLNE
20 SDKYHVTVTLELVTPQPSPASWRKVPVGSVCGIAVTLASLLVSGATRARSWR
TSRSRTSRRS

<SEQ ID No.:0237;PRT;Methanopyrus kandleri>

25 LRGPWIPALALLITLIGSTSAAPTIVLDESHLVFKVPDANGQVVEKAGDNPGYRV
PPGDSGNYGGYKFPACAYWVPYFSLSYEDADGRIHVFPVTRGSQLGVMGIADH
VINEVLPSSPRIEDLSSGTPDPLELFTALGYSHLVLIIVSEYDSLAISSALALKWKAVE
DLRRRLPEAAEHPEKVGVIAMARATVISPTETKDVLIPLVPGAHVINPASPFTWQG
VENDPFYRLCVNSDLIVVYKTEAFREEARLVFGDDAIYVRASADITAGAPAVIFNVP
RRAESWRVAQTFEPWPSSLYLGALYGLPIAWAEDLRLTGYSWEGVILVPSAESG
30 MYWDITSEFDEVLPILGANPHIFLSYMTLTDPNWNSIQVGTPNFYAALPCLGHYPW
DLIGVDLTSTLLFDLKDYLVTYNRIPEGNDQELGWGLVGPYAVVFEQPKGRPLILT
WYALASGFCEWAWNRYLEFNRIPOQLYDVEAVAVGLEGVFALAKGLILGDINNVL
NRDYRFTVFFGYPIRSWETEARIQFDADAPNRHYTVIMGRGDSVPDPVPMFMAQSS
DVYAILTLEPLRTDTGPDVSPNNAKRWWVTPWVALSIVPLLSRRSSR

<SEQ ID No.:0238;PRT;Methanopyrus kandleri>

35 MLREAVKDIESGHVDPSERIHEYLEKIDRENPINALIYINGGAPEEVEGSEGPLAGVAI
AVKANINVEGMPCDCASKTLEGYRAPFDATVVRRIKEAGAAVIGIANMDEFAAGSSG
ETSCHGPTDNPRCPGRIPGGSSSGSAAVAAGLCDAALGSDTGGSIRNPASHCGV
40 VGFKPTYGLVPRQGLIDLAMSLDQIGPITRTVEDAALLLEVIAGPGEDVEGTVRNAEV
PRFSELLDPEEVEGMRIGLVREFLEVSEPEIAEVAKEAARALERAGATVEEVSLGRK
LVDVALPTYVINYVEFFSATRRFDGRRYGRRIEHVCGKEVLRRIVAGAAISRQEV
GQYYERALRARTWIRRRLEALEGYDALLGPTVPKPPHRIGEELSVREMYGYDVL
VIPNLAGCPAGSVPFDTINVDGDRVPCGVQVIARPWEDLTALNVMAALERAASFEP

<SEQ ID No.:0239;PRT;Methanopyrus kandleri>

45 VTRSylvFDVGRYRELAEELVKPEDIVVEVGAAAGDTTVRLARNARLVIAFEKSEEM
FERLRERVRDLNIVLCEDGFELGEVLKRTERVDAVFIDVGGGAQPRLLALALWEA
YYSRFRPRVIVVRNRRLCRLIETVERVECDDEV

50 <SEQ ID No.:0240;PRT;Methanopyrus kandleri>

VSPLAEGNEPREGHPHHPHSREELEKRLEKEREAEKNLESVEHVLVMSGKGGVG
KTTVSVNLALALAEDEVGILDLDIHGPNVPEQLGVTEPPQGTAGLFPPLSGYRDVK
VMSIGTMLEREDLPVLWRGPRKSGFIREILVKTRWGDLDYLIIDMPPGTGDEVMTAL
QMLPEDARNVLLVASPESLAFSDVVKAGEAVDKLEARLIGIVSNMHGIVCPECGSTI
5 EYFSDDYSEKLAERFDTEVLARIPLDPEAKRKAEEEEGKPFVIAAPDSRVSEAFSELA
EAVRDRL

<SEQ ID No.:0241;PRT;Methanopyrus kandleri>

VHAMLVALVASAPATLAACAIFKFLDGPLYEPVRGGTTPRGVGVIPALIYAYLAPLTHG
10 VPVAAHAVLGFVDDALGRTPTFRGVEVGHARGTAMLVAFGWCCWWKFHPITGLVA
GFLPQPANIVDMQPRAFTFAALTATVATLPWWNPTLVSVAWAALIPYVLLDLKGRV
MLGDAGNASVATALLACTRGDPIGSIAFLISFTLAGAFYRFKVEPRLREYLEERLEIE
DPTLMDAVWDVLTGGALGDLIAKTFRGTEVPECGRRLARLLGYRRLVLIGRSTVGE
RVRR

<SEQ ID No.:0242;PRT;Methanopyrus kandleri>

MGRFERNLAAMFTEYALISTLQALFWIVLPRTLGPQQFGKLVLLINLAGFLSDPIHQA
VAFACSPELLGLGDRERASLCVSAVIVSLMLSFAVASAMLLAITFLPVPEKLRIVSDP
WVASGLLVLCMSPVTKVVEPFLAAGRNVFVVAIALGHAAKVVIPLLRTSWVGAAI
20 CTGLCPLLAGLATPLVGRPRGWNFAIGYLTRGMVIVVDRLVELGSYAYAVLLTYLL
YGSKTSFAVGLGLAAYKFAALTLEAFVPPITLEVGAGEEEQAFRGLRRLYPASIATA
VAIVSCADLAPVVLSTEYGPVPIVRWFSLPTLLPYHIALRAYLIGSRRLRLLLVYRT
LYASSFFVILHTLTGAFGPVSVPPLGLLAALSSAPPMVAMIRRHVTVE

<SEQ ID No.:0243;PRT;Methanopyrus kandleri>

VSTEWVTRHLDYDGEETWLIESHGPPDDPTPPCSPTCRHCYATQLPPDARRHLVID
ELSMYPSELVNHPRLEDVRRARELVESRENPLKVITSGKFLTGRKLRILLRYVDQL
DFHLLSTDPSERAKLTRESVREAAARVLELVREAAREVDTVANVAVPDYNLNSLPRI
LRNLDEWGLHKCVVIPVGVTRYNREGIRPPTPDEMRFLEICRRMDRELDLDVPC
30 DSLVPLEEHLEGLDDLASRCAEALGGVDSRVGLVTGEMFGPVIEELCRATNEKLGR
EVLEPVIVENRYFGGNIGCAGLLTGEDVLHELEHRDLDAIVPRISVELGSFIDGVITF
EVSLHAGCEIVVGPRLLEDLPDVLVEITHSVTV

<SEQ ID No.:0244;PRT;Methanopyrus kandleri>

MGVRSMEARWELEWEGEEPEGAGIPLSRFSKRLPDVEAYRHQVETAEAFENGHVL
35 LTAGMGAGKTEAALAAIEHERTFPAVFVYPTKALARDQAERMIRYGYDVVIADGDHP
GWRARIQEAIEVVNTNPQMIWIHARRGLQFWEFLTDFVARCLWDEVHFGPRQVNLL
LGIVRALRDRRHLFMSGTVGHPDSFCGEVERATGETCTHVRGRGKMAPRKFFVRN
TAKMADLLEDITRYVREDSKTLVFFRTRAQAEHAYQVLCRRYGLEGYVTLHHGALP
40 RDERRRAEREFKGRGRASVMITVKTLEVGDVGSVTRVVHYGIPDRVSDFWQREGR
AGRRGQEAESVIYPADPWTSFVTRTPRRRFREAYLEGKVERILAYAQSHLAAPPESN
PTESFYGEKDAYRVVREDNPRAVLRDQVDPEDVPRAWAPGCAFRAGEIWWVSG
PPDRETLMPAVPAEEYDPTVAQLIEEGWWTYPRIEVYAEGEEECGIGYVELRWD
TVLSPPPDEPERPILVEHGDITIRVKAYYIRLEDPDRLRRRVGADSAEHAVHALNYALK
45 LKHGVPLSLLNHVHRPVESLIPEESDREAFLLIYESPPAVMPLLEWESAVEEAILAR
KENPRNLRLPRCPWPKEVDVTFESLIERYLLGILQLAEKLREREGLPDGVEGRQPK
CGV

<SEQ ID No.:0245;PRT;Methanopyrus kandleri>

VHLHVLVRARKDASAVESALERYYPDWWEWKVETLGGERDPSWIVGLARERFEGSD
50 ALWKVLLLGRRSYPGRGRVWMEGWSAVNVGKAEVRNARLTEIVDGIELGRAAPR
LSVAFRRVPELRRGRLLTENQDADTMLRWGKFTETIAELAGEELPPGAYFSLRKPG

NPPEEVLYDASGKPILRIITPDEGEPSVSVLGDGEPFDSRAFVRENRETLENLFEDA
VDFLGGVAEEFDVLFVPVSGGKDSTCCLAIAVETTDRLGIDVEAVYVDTGYDLGRDV
VEDVGAALGVDIKHVDVSDAFERGLRERKPTHENRWCTGVKLSGIKKVLKDLEGDV
LLVVGDRDAESRRRLRPPVHRNRLLDVPEVNPVKGWGGAEVLGTLFRLGLPVSE
5 LYEIGFYRLGCSVCPSLTAWERALMELSR

<SEQ ID No.:0246;PRT;Methanopyrus kandleri>

MAQEVRLRLSSTDHYKLEEV CERIKKVVEETGAQMSGPIPLPTKRLLVPTRKSPDGE
10 GKATWDKWEMRIHKRLIDIKGDERTIRRLMRIHIPEEVHVEIIMK

<SEQ ID No.:0247;PRT;Methanopyrus kandleri>

VAKEKEHINLAFIGHVDH GKSTLVGRLLYDTGVIEDKDLGEGEDKFRVIMDTLEEERE
RGVTIDLAHTKFETDNYEFTIVDCPGHRDFVKNMITGASQADAAILVVAADDGVMPQ
TKEHAFLAKTLGIDQLIVAINKMDLVDYDENRYEEVKQEVAAELLKTIGYNVDEIPFIPIS
15 AFEGDNVVEKSDNTPWYDGP TLLEALDNLEPPEKPTDKPLRIPIQDVYSITGVGTVP
VGRVETGVLEVGD TVRFEPAYTATGGRKGEGEVRSIEMHHEEIERAEPGDNIGFNV
KGVGKNDISRGDVACHPDEPATVTPDDTFIAQIVVLQHPSAITAGYTPVFHCHTAQ
VACKFEELIEKIDPATGEVIEENPD FLKTGEAAKVRIRPTKPMVIEEVSFIPQLGRFAIR
DMGQTVAAGMCMVKIEKEE

<SEQ ID No.:0248;PRT;Methanopyrus kandleri>

LTVRAGVIGVGMMSGHHARVYHELEETELVAVCDVNERRVKEVAKKYDVNWYTDH
RKMLQEEDLDGVSICVPTKYHADIAVDALEAGVHVLVEKPIADTIENARRIIDAAEDH
GLKLAVGHIERFNPSVMKAKEVSRGDLGDIVVMSAKRVGPYPPIRDVGVIVDLAV
25 HDIDVMRYLAETEVEEVYAAAGSAITRTQEDYAEVMLRFEGDPTGLIEVNWLT PHKE
RRLEVTGREAILIEQYIEQELRLMDREGVKRFNIRKEEPLKLELRDFAESILENRDPLV
DGEAGLQALRTAVAALKSVKEDRPVSLEEVE

<SEQ ID No.:0249;PRT;Methanopyrus kandleri>

VGDKDDVRIGVFVCHCGVNIKASVDVEEVVEYAKKLPGVVYATDYPFFCADPGQEII
30 QEAIKEHDLDRVVVAAC TP KIHENTFRNCVKEAGLSPYYMEMVNI REHCSFVHMQE
PEKATEKAKDLIRAAVERAKRLEDVPTKEVEVENS VLIIGGGIAGIQAALDLADQGFK
VYLVEKEPTIGGNMARLAKTFPTDDCAMUILAPKMVQVGNHPNIEMITYAEVKDVDG
YIGNFEVTIEKKPRYVDEDACTGCGVCAEVCPIEVPNEFDLIGIGTRKAIYVPFPQAMP
35 LVYTIDMEHCICQGLCEEACPDPAIDFDQEPEEIRLKVGTIIVATGYEEFDASKLEE
YGYGKYDENVITTELERMINPAGPTEGHVIRPSDGKEPHRIVFIHCVGSRCPGKEEK
GEAYCSRICCMFILKNAQLIKQHEPD AEVYCCYMDVRAFGKG YEEYERAQKQFGV
RFIRGRPAEIVEDPETKNLIVRVEDTLTGEPMEIEADLVVLGCGLVAPEETYSKLADIL
GIDRSPDGFFKELHPKLEPVSTKVRGVQIAGVAQGP KDIPDTVAQAKGAASEASIPM
40 SQGKVEIELITATVDEDVCGGCGACAQVCPFDAIEMVEKDGKRVAEVQDVACQGC
GQCAAACPSGAMQLRYRDEQLMPQIEALLAEALEEEEEEE

<SEQ ID No.:0250;PRT;Methanopyrus kandleri>

MRASAIATLLVAMVVIPIASAAELQTSATTETAPTATVKPSAGADAGSDVGVSVVGV
45 PLTIGTDETKSTTTGSANVT TTTIPPEYYS LASGLTQSLCDALSNGVAAVIDCLRGQA
YHEPRPEDIVFAVVL SAVKAVVNQKLHEESFQKPLNEFHLM LVQFIGPNATLMQLLS
AVTAELQVNLKEAKSFGPIAMLYDRVENALKSASGNEKSAYESAKSELDNMVNNLT
KYASDIFCMLLSKCFPLQL

<SEQ ID No.:0251;PRT;Methanopyrus kandleri>

MVNRPARIYREWKGPA YTRREYIKGVDPKIQQFDMGNPAGDFDVEVSLVARERA
50 QVTHNALEAARVAANRYLTKTVGRQNYHLKIRVYPHHVLRENPLATGAGADRVQE

GMRLAFGKPIGTAARVREGQRVVTVRIDPENFEHAKEALRRAGMKFPFPFTIVVDK
GEELVQD

<SEQ ID No.:0252;PRT;Methanopyrus kandleri>

5 VKYVRWFEEISKDDVDVAGGKGANLGEMTQAGLPVPPGFVVLSTAYDEFLERTGL
KEKIKEILSSHDLSDNDELQEAEEIQRLIVEVEMPEEIREEIVKAYRELCEKVGKEEE
FVAVRSSATAEDLPEASFAGQQETFLNVQGEEDVVKYVQKCWASLFTPRAYAYRE
EQGFEHLDSIAVVVQKMVDSEKSGVMFTVHPYTGERDKMVEAVWGLGEAVVSG
10 EVTPDTYIVDKNTFEVIEEQISEQEWMTKDPETGETVKA EVPEDKRDARKLTDEEI
KELAEIGVAVEEHYGFQDIEWAIEDDEVVLQSRPVTTIPEEKGGEEIEAEELEGK
ILVRGLGASPGIGTGEVKIVMDVDEIDKVEEGDVLVTKMTTPDMVPAMRKASAVTD
EGGITCHAAIVSRELGIPCVVGTGNATEVLEEGQVTVTDGERGVVYEGDVRKALRA
EEEEEEEREKEIVVERPAAEPTATEIKVNVSMPEAAERA AKTGADGVGLLRIEHMIL
15 GVGVHPRKLIEEGEREKLVQVLMDGIRKVADAFYKPKVWVRTLDAPTDEFRELEGG
EREPEETNPMLGWRGIRRDLEERETLECCFEAIRRLHQEGYDNIGVMIPLVQHPEE
LRRAKRIAKEVGLKPHRQVEFGMMVETPAAAVLIDEFIEVGLDFVSLGTNDLTQYTL
AVDRNNDKVAYLYDEKHPAVLRLIKHVINECKEAGVKTSICGQAGSDPKMAEILVKA
GIDSISANIDAVPQIRRIVARVERKILLDKMREF

<SEQ ID No.:0253;PRT;Methanopyrus kandleri>

20 VSLLKHLSELGLSEREARVYLVLVRAGEANAREVSEGVEIPYSKVYSVLRSLLEDKG
WVEADRSARPTTYRPVSPDVAVKRALEQELNRIRRELEEHAKVAVRKLSEIYRAER
ETVARTYHGKSARETLAEVLRSSEDIACIVHLGRNLPRWLLESLRRMEGLMILRAKE
25 GSEVADELEPDVKAPIDIEPRNTLIVLSADRREFFLGKFGEGDYLLSLEEPILAQGIHD
AVTRACKSRSRHA

<SEQ ID No.:0254;PRT;Methanopyrus kandleri>

30 LESKHLRFLRVLEEVVSDLPERVLRRLCRLHDIRGHRGDTREHSLKVAYLCWRLS
GKFRVDGKIALESGLLDIGYGIPRCPLCKLDPGGHCGICHWRTGSELLEEVNVDPA
VVRVRRHMFPGPPRPTPLDWCVWTSCLKESVLSFLGFRVLPDPVLKRAVSAIYT
LS

<SEQ ID No.:0255;PRT;Methanopyrus kandleri>

35 VIVVSKVLVDLKVLPESADVDEELKEAIREKLESMVDVDIEGMEEEPFAGLKAIRVK
VVVPDAEGGTDALEDALKEVDEVNQVEVVSASRTL

<SEQ ID No.:0256;PRT;Methanopyrus kandleri>

40 MTEAGRIERADYAVCSACGGPIAPGERAVSHPCPKCGEVVITRCQKCRRLGNRYQ
CPNCGFIGP

<SEQ ID No.:0257;PRT;Methanopyrus kandleri>

45 MVEYDEELDVRGKICPMPVLETRKKLEEMSEGEVLKVVG DYPPAKDNIRRFAEENG
HEVLDVEEGEDHFVIYIKKKG

<SEQ ID No.:0258;PRT;Methanopyrus kandleri>

50 LDIREIWKELGIDLERHDELLEALPEVYEEIFLSQENRPERMSYFDEVVADIHGARVR
ELYEMRQEGKPILGTFCVYVPEEIVLAAGGVCVGLCGGAEFPIPD AEKYLPRDLCPPI
KSSFGFLVSRPCPYCQVATVIVGENTCDGKKKMYEIMSEHKDVVVMEMPQVKDEE
GLEYWHEQLIKFKEFVEELSGNEITYESLLDAIERVNAKREAFRKL YELRKHDPAPIS
GRDANLIAQIAFYDDVDRFTEKVNELNEELEKRVEEGEGVAEEAPRILVAGTPMPIP
HWKLLYVVESCGAVVCEESCTGTRYFEREVSTEGDDVEDLIK NIAEAYMETKCAIF

TPNDERVKDIIKKYKEWNC DGVILYNLKF CQPYAVEHSKIESRL REEGIPALKLESDY
SEEDVEQLKTRIETFLESLA

<SEQ ID No.:0259;PRT;Methanopyrus kandleri>

5 LGRKVIKDVVCPFCGTLCD DLEV VVEDGEIVEVRHACRIGAAKFLTAQEDHRHTEPM
IKENG EWKKIDYEDAAEETARILVEAKWPLMYGWSSTLCEAHEVGIEIAEKVGAVID
NTASVCHGPSTLGLQDAGVP SCTLGEVKNRADV IYWGCNPMHAHPRHMSRYTAF
TRGFFRPK GREDRTIIVDP RRTATAELADVHLQVRPNEDYELISALRAAVHGIEIER
10 EEVAGIPVEAVHEVADLIKEASF GTLFWGMGITMSRGRHRNIDNAICLIRDLNEYAK
WTLIMMRGHYNVTGFNEVLTWTTGY PFAVDFSRGYPRYNPG EFSAVDVLIRGEVD
AAFVIASDPGAHFPRKAVEH MARIPLVCVDPHWTPTAELADLYVPVTIAGIEWEGTA
YRMDSVPIRMRKVVEPPESMLNDVEFLEMVIEKVEEMV

<SEQ ID No.:0260;PRT;Methanopyrus kandleri>

15 VRVLGVDAGSSHLKCAIVEDGSLEDHTVVESTGPVKKVLRRALDELGAGIDEFDVTA
VTGYGREALSDEFDETVP ELPAVALGASQLVEGARTVIDVGGQDTKVMKVEDGKV
VDFQVNDKCAAGTGRFVENVC RRLGIEMSEVDEHASGADDPVKINSMCAVFAETE
VISLVNRGIDVERILLGVLD SVAERVATMIDKVSPEPEVVLVGGMARCRVFAELLSDR
20 LEMGINVPNEAHVAGAFGAALWVLEK

<SEQ ID No.:0261;PRT;Methanopyrus kandleri>

MARVSPLVTGLVAGVSAAILQAVFKVSP PPAYGICIACHTRDLVNWIVNHAAGTTLG
25 MAPVSKPFPVLTVVGIFIGALIAAF AHGEFRIRRTHPILGFVLGFLVINFALFMGGCPI
RTSLRTMYGDVALLGLISIAVGVILGA EGYLKRKA

<SEQ ID No.:0262;PRT;Methanopyrus kandleri>

30 VAEYLHAIGTLAFGV LIGYLGQRSAMCFIGGIRDVYLLRDTWLVQGLIGFLIGAFFGLV
VFGAAGMIKKFPWFLYKGASAI PGDVLGKKPGFAAHAAVTVIGGLGVGFLSVVQGG
CPFRNYVMAAEGNVTAMAYLLGV FVGAVFFHACIVPIFGPPK

<SEQ ID No.:0263;PRT;Methanopyrus kandleri>

35 MEMGLLSRLRSAFSRDEGPSDEREGKGLIVFESARDAMKAERTLKEAGYDVRAVA
PPPEIREGCDLAI EYDLVDEVGVRR TLEEIGVEPLKFVSLEDPSLKPIELVRVKEVDG
YIMVRCGNMKVTVDRDGTIVNVSGG GCPDVPYLAHELVGKNVLELSENSMPASLG
YTLCAYTLDKAVRKAKEVLLGEGS

<SEQ ID No.:0264;PRT;Methanopyrus kandleri>

40 LAAAAARVLEFLGEDEPRLITAGDLGEGDGSLEIYRRLREVDDDLVIHYIKPKIDEIR
RVDTS GKVIADAGGMYAAKAAGIGPEFHLFLPDPGELAFLADEKAHHPAYVRGFIAE
VDEEEVPSLVRRAYEEDQVPDYM VVKGRRDHVVHRGEVVETVDEPLVEAMECIGG
TGDTLTGIVAALIAAGFGTEEACVIGCRVNRRLGEIANATPTTRIHELTRAIPALCEE
LRE

<SEQ ID No.:0265;PRT;Methanopyrus kandleri>

45 LAEEEEPRIGVYVCHCGVNIAGVVDVKEVAEFAKTLKNVVVARDYKYVCSDPGQEIIQ
RDIEKYDLNRVVAACSPRLHEPTFRRCVEEAGLNPYCFEMANIREHCSWVHMDD
PARATEKAKDLVRMAVAKARLLESLETIKVDVTDRALVIGGGVSGIQAALDLADMGF
EVILVEKEPSIGGRMAQLDKTFPTND CSICILAPKMVDVSKHPNIKMYTYAEVVEVDG
YVGNFTVKIEKKPRYVDEDACTGCGACA EVCPIEVPNEFDEGLGMRKAIYKPPQA
50 VPSVFTIDEEHCIRCGLC EEVCDADAIDFDQEPEIV EEEVGAIICAIGYDTCDPTEREE
YGYGVYDNVITSIELERLINASGPTGGKVVRPSDGKKPKRIA FICVGSRDPHRTNP
YCSNVCCMYAMKLAQLIREKYPETQIDIYYMDVRAFGKGYEEYYERSQKQYGIRFIR

GRPAEIVEDPETKNLIVRAEDTLLGDVVEREYDLVVL SVGMVPRDSADVIQEVLSISR
SPDGFFMEAHPKLRPVDTAIDGIFLAGACQGPKDIPSSVAQGSAAAAARAATAALAGE
VAVEPIVSEVDEEICGGCGTCVELCPYGAIELVEKD GKLVAEVTAAALCKGCGTCAAA
CPSGAMEQNHFKTEQLYKQIEGAFRDPA

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<SEQ ID No.:0266;PRT;Methanopyrus kandleri>

VRGVGTLSSEMVVNVEPVTRVEGHGKIVVEFDEDGNLKDARFHVVEVRGFEEKFLEG
RPIEDAPILTPRICGICQVAHHLASAKAADEVFGVEPPEPARKLRELMHHAATVHSH
ALHFYFLAAPDLVKPEEEDPMKRHVLAALARENPEVVKCAIELRKIGQTIVEAVGGKPI
10 HPVTA VPGGVSKPLEEDRREELLELARS AVELAERTVDLAEELTRREEEGLELGY
LESYHMGMVSDGVHELYDGVIRVVDPEGNV DREFEPSEYLDHIAEAVRPYSYLKFP
YLRDKGEEEGLYRVNTLSRLNVCDR MATPRAQGRYEELVDEYGKPCHHPMLYHYA
RTIELLSAERCVELLEDDEITGDDVREEVD PDDVTGEGIGCVEAPRGTLIHHFKTDE
EGLITEVN LIVATVQNNPAMD LGVKKVAEEYLRSPEDASPEVLNRMEMVIRAYDPCL
15 SCATHVLGERPRLTLEVHRAGRLVRIVEG

<SEQ ID No.:0267;PRT;Methanopyrus kandleri>

VKGVVRLVKIATTWLCCCSGCHVSVLDLHERLLDLLGDAELVHCPVLM DTKIEPEDV
DVVLIEGGIRNEENVEVAEEFRERAEIVAVGTCACYGGVPGLANLYSNEELLRTVY
20 VETASTENEDGVIPSEDVPELTWRVRPLSDVIDVDYELPGCPPEPDLIADAVTAILDG
REPELSTTNLCEECPRKKEETVIHEIRRPVEGEPDPDRCLLEQGYPCMG PATRAGC
GARCPEAGVPCAGCAGPAGEIPDQGAEMMSAIASIFRADVDDVDPS ELVESVPDVV
GWFYRFTLAGSLMPFRVDRE

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<SEQ ID No.:0268;PRT;Methanopyrus kandleri>

MGEWKPKIIAFCCNWCSYGGADTAGVGRMQYPPSTRIIRVMCSGRIEPSLV LKAFR
EGADGVFVGGCHLGDCHYQSGNYKWWRR AELLKKFLAEIGIEPERFRYEWISASE
GEKFAEVMTEFHQTLLLELGPLELRERL KRL

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<SEQ ID No.:0269;PRT;Methanopyrus kandleri>

LKALEQLSSYVAENRAGNRWDFKLAGIRVGRGRTVTFFRHILLASLACLTLP IAATCV
NEEFESKVESLIQNPDFQGTKEITLYASGSYVMTGRIKVSYRGPEEVEPVEVDKLIN
GLKELREDLDPLAQNEPIKDLLGALKKFDDTSDVLEKLKEKTQGLKLAACEIDVDL
WYVGETGTPPSDLPQILQQLRTEGELHLSYKIPYPEAHVYVVGSVELLDRALNLP IR
35 AVFSYDYPNDGSGVKVSVDTEHRKFTIETTDNIYNLIVVELTLHGGLQEVEKLADLSV
ESSEDLQKLLENTEVEKVECYPRGGRTAEINGLPLMVDEGAIVVYAVGSNPINSIVA
SKIAELMGKNPLVVT LGNADLQVGTGKTLVIKGSAPGGLVVIYGPAGPDNTLDVTS
RVGTLQVARALGAQVPPLVSLFGWILGPLLGSI TTTYTPAFSGELRMSPRGIGMATP
AVIAALLLVGHGRRRSK

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<SEQ ID No.:0270;PRT;Methanopyrus kandleri>

VILKFDHWSGPLYLHCSIRRGDPRIIERSSTGVIIQAISTEYADYRVIASAA CRAIRAF
ESDRNLARSLDLEFLVRLTGTRQIREAIDRAEPGDEFVLVVASRDRKKVRGV LKELE
EEAEEL EEFPERDGYKELLRTAASVDAEE

45

<SEQ ID No.:0271;PRT;Methanopyrus kandleri>

VDPRELAERLTERDLRILIH LAESGEATPEELAESLDVDLGPVMRSLYWLEERGLIES
EEETHEVYELGDEGKEYAE EGLPELRIVEVLRKIGGEGRL EEVLD RAGVPRKLAGPV
LGWLRRKGLAEIKREDGETSLV LLEEEPEDVDQSVLEALAAEGSASVEELARKLEM
50 DEEEVEKALKRLSERGDVLRAREETVKKVRLTERGEEVAEHAPEVLERDWITELKP
EHLREGTWKEKEFKPYDVKAPTSP TFPGKRHPLKEVINEIRRIFLEMGFVEVSGPLV
ESSFWNFDALFQPQDHAAREMQDTFY LKEPAEAELPDEEVVEKVRVHEDGGDTG

SRGWGYEWDEGVARKTVLRTHHTTAVSVRKLYEVEGPPLKAFSIGRVYRRETVDYK
HLPEFHQCEGIVLAKDVSFRDLLGILEEFYRRMGFEFVRFRPAYFPYTVLSVEPEVY
FEEKGDWVELGGAGIFRPEVLQPLGFDPDVCLAWGLGVERLAMKLKGIDDIRDLY
MSDLKTLLLELPTARARR

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<SEQ ID No.:0272;PRT;Methanopyrus kandleri>

VFSGIREGAVQVPKWILDVLTGKKLRVHELRAVWVGHRELMLLSMDVRDDENPLS
LTAGVLGLFSAALADVFTWSRGSELSYPLTSANGDAWRVCVDAAVLAVIDAFSSEL
EVSVEAFVSEAGIPWLATLANNGFRPESVIRGTDEVFVATLLNLLKYEVKHRGCDR
WRDWWRRLDR

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<SEQ ID No.:0273;PRT;Methanopyrus kandleri>

LESPVKEHREGTLIRVRVNPADTTDLKGVDEWVRGVLEVDVAAPPVKGKANRELLE
FLGRKLNTTCELVSGEKSREKLVLRDVSVDVDEVKERLGLR

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<SEQ ID No.:0274;PRT;Methanopyrus kandleri>

VKPPPEEAWIGRPVRPAQGFHTRVSMIAGVMLGGPADVEFPRMAHPLELPHYLEID
GDTWRRLRCRLESLEDSPDLGDAVREYIREAFRCITKPDFATAKACTPVIALDTP
LWRDARSVRAIARLLTRVTGVEVQPPPIAELRATLYPIAERALVSTLLAQAVAH
IRSLGLRSEYLSAYLDAPSGESPPELGDVSDLYATLVKDFDGYLARVRLNRYVT
TAGRRFVLTPDDYDPTWRGYLQGLRRFWENRRGMEEIIRQWGLA

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<SEQ ID No.:0275;PRT;Methanopyrus kandleri>

LREANADADPPDEVRIFDTTLRDGEQTPGVALTPEEKLRIARKLDEIGVDTIEAGFAA
ASEGELKAIRRIAREELDAEVCARMVMKGDVDAAVEAEADAVHIVVPTSEVHVKKK
LRMDREEVLERAREVVEYARDHGLTVEISTEDGTRTELEYLYEVFDACLEAGAERL
GYNDTVGVMAPEGMFLAVKKLRERVGEDVILSVHCHDDFGMATANTVAAVRAGAR
QVHVTVNGIGERAGNAALEEVVVLEELYGVDTGIRTERLTELSKLVERLTGVRVPP
NKAVVGENAFTHESGIHADGILKDESTYEPIPEKVGHERRFVLGKHVGTSVIRKKL
KQMGVDVDDEQLLEILRRLKRLGDRGKRITADLRAIAEDVLGRPAERDIEVEDFTT
VTGKRTIPTASIVVKIDGTRKEAASGVGPVDATIKALERALKDQGIDFELVEYRAEAL
TGGTDAITHVDVKLRDPETGDIVHSGSSREDIVVASLEAFIDGINSLEMARKRS

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<SEQ ID No.:0276;PRT;Methanopyrus kandleri>

VTHVVLVGLLETDSGKTTAALPLVSALDLVPFKPRSGHNWVLHYDHTRRRCVELGL
PVSRDVLKLAKVAEVDLPLITLNPVHRVWTSPDVGTAVKSDVSLRYFSAQTDAYVL
MDRLDETFLYTEGTELRYVPDETMEMARECEVREVREEPAPEELRRTIDRAWSR
VRKEGPVLVESLNNLAVPWPVGLKYDGVAVAVGPGTALVYDLRDYARAAETLAGP
EAVTSLLEVLPLEVVRLPPLDRTRRS DPRKLEEAYRELIGAVQERL

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<SEQ ID No.:0277;PRT;Methanopyrus kandleri>

MLEWRPEPGYDPLETAERVGRWVCEGRRRKYYRFRETRFYGGCATADAVGCNLD
CAYCYVNYPRRHPWDRRWKFHRPIDVVERLKNMGGDVVRVSGCEPTLCHEHILELI
ELCGRELPRDKFVLETNGTILGADRSFVRELGNHEHVHVRVCLKGYDPQSFAKITN
ANPDGFDLQLRCLRYLFKEGISFHPAIPRLFRPEDIDKLAGVLSDIGVPPSSLEVEPIR
VYDHVRRELRRRGLTVVR

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<SEQ ID No.:0278;PRT;Methanopyrus kandleri>

LCGDPGLLTLVLLILLAVASLPAGSVVLASALAPVAVVGGLALEYGLVDPRTVPVFG
LLAVPGLILGLRTARKYPKQHLRHRLIIAVIITVFFLSNLTIIYVFKGTVSFVAGGDVPR
HASLALSFLTGTGKPPVFYDTLRREYRPVHYPSGLGHAAITESIVSLLFHPKDLREAAS
WRVQYGSTIIELVEYHVSTAMIASAIIILLTLGRLPILVATLVACAIYLTYPGPVPPFFQ

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- SLAMLSASIVAILNSRWISTFLILSAVVIHFYSVVVMSLLIPVLIQTRKQSTISLLGMAT
GIIQFPYVHWSAAVHFPRYPAPHPNHLPPDRELGPVYIIQFMFTAFAAYPPFIFPNAS
DMLYTIPFIAAVMLILIRKLLPQDLKIWIMYITTIVILGVTFGRFIGKRFLFTAPLLTTLT
LGFAAANYHLLALSILISYCALTTDWWYIYFINTPPIDVLEKHWKLFYNSFCKGETIAT
5 VSIGLLPFTSTWKPQKVAQVVRTFPEPGLPILVTEENNLTLRLLPLTQVKGKYIVEK
LPPTKRVSVD DRAGSFRRNVLVAAERYDSHVLTYYAIMSYGSVPTVLVIKGTWG
ASMAFMTLMEPTDDL SVFIRTRHVPNGYLVRISDWQGV RV MKITISGARWVGDKLV
FHGSLRDLIANIRVTGDLV
- 10 <SEQ ID No.:0279;PRT;Methanopyrus kandleri>
LSDPGLFMLILLVLLAVASLPAGSVVLASALAPVAVVGGLALEYGLVDPRIVPAFGLL
AVPGLILGLRTARKYPKQHLRHRLTIAVILLTAYLSVDLTLYAFKGNIGATMGDPSRH
ASYALTLLTAGEPVFDTLRQEYRPVHYPSGLGHIAITESIVSCLYHPKDVQEAS
WQVQFGSVFLELLEHHLDAALITSSIVDLLLIARGRLPIYIIPPLAYITYLTCTAQYAEFI
15 PFFQSLAMLAASAVALILNSRLLSGLLALGAIAIHAYGVIVTTLILALLWAKTRITVT
PILLGTIIGAIMQYPYVHWSVMTYFPRYPAPHPNHLPPDRILSPVACLLQFFFTAFAAY
PMILFPTTNSLPYVLPFTVINVLIIKVRKLLPSVLRVMWITCIVTILALAVVSGSIVGGRL
LVVPLL TAMS LVLPAANRNLLALGALFGYCALTIHWWLAIHHGNEGISTLPVWVLKE
HWNIFYKSLCNKDVIATLPEGLLPFTCTWKPREVAYVVRTFPEPYTSILLTAKEGSEIL
20 LYAPPVRAERGYIVKKLPPPGRVWVAGNRAGSLRCNVLIGAERYNRQVIIHVNVNY
SWVPIPTINIKGKLRKRAIVLSTPKSSTLPAINVHRIPEGFLVRISYSHGVRVVKITISGA
RWVGDKLVFHGSLRDLIANIRVTGDLV
- 25 <SEQ ID No.:0280;PRT;Methanopyrus kandleri>
LGYEDEFPESELEFKRAERVMPPGGVSSPVRFPYPFYVERAEGSRLYTVDGHVLI
DYCLAFGPLILGHAHPEVVEAVVERVREGFHYGTPTLPELKLAEKVVELVPNVEKVR
LVNTGTEATMSAIRLARAYTGREKIVKFEGCYHGAHDAVLVRAGSGASELGAPDSP
GIPESVAENTLVC PFNDVEAFVETVERFDEEIGAVIVEPVLGNAGCVPPDEEFLKVL R
EYCDGTERLLIFDEVITGFRLELGGAEYYGIDADLVCLGKILGGGLPIGAFGGPEEY
30 MSRVAPEGKVYQAGTFNGNPVSATAGLVLTLEVLERERPYDELSSKAERLASALEDG
LEDRGIEGVN RVESMFQVYFGIEEV RDYADVNSADHDAFKRFHRELLEHGVWIAA
SNYEA WFLSIAHTETDLERTEEA FEEALDRLTG
- 35 <SEQ ID No.:0281;PRT;Methanopyrus kandleri>
VSEIRLGLVVTEFNREITYAMEELAVQHAKDLGAKVVERVLVPGSFVPLAVRKLE
RDDIDAVVTLGAIKGD TDHDQAIAQQA FRKIQDLMVEY GKPVALGISGPGMTRMEA
LERVHYAKRAVEAAVKMVRRLRELEGE
- 40 <SEQ ID No.:0282;PRT;Methanopyrus kandleri>
LAEDDKVFRRARERLVERLKS LGYIRSNRVAEAMLKVPRHEFVPEDLRDRAYVDSP
LPIGRGQTISAPHMVAIMTELLDPRPGHKVLEV GAGSGYHAAVVAELVKPDGRVITV
ERIPELADFARNNLKKTGYDRFVKVLVGDGTKGYPPEAPYDRILVTAGAPDVPESSL
EQLKPGGKMVIPVGDRHMQELWLVEKTEDGEIRRRRHGGCAFVPLIGEEGFQEPE
S
45
- <SEQ ID No.:0283;PRT;Methanopyrus kandleri>
VIEIMTREEFFDLITEGLKTAEIRPSDHR SF RYLEPGDTLVFKNFKAGTMRCIETVVRN
VEKDLPKEAAERFYQEAGFESPEECLEGLKEMYDGLPEKVDVAEFEPVREWEE
- 50 <SEQ ID No.:0284;PRT;Methanopyrus kandleri>
VFFAGTGGGRFAMITQKRRTGGFRLEFPDFHLHVDPGPGCLLSTRLSRRPTTAVDA
VFSHSHPDHYAEAEVLVEAMTRGGTKRRGT FVGSVSAVEGYSDSDGYGPVLSA

YHRSLPEEVVALEPGDEIDLPAAGTLEAVPTTHGDPTGIGFRLETEDDSIYYTGDTELR
EDFFEVIEDVTVAINVVRPGSDRIRGHLCTYDVIELVSEAPELRKVFITHFGMKMLR
VGPGREARRIEHETGVETVAARDGRAYDL

5 <SEQ ID No.:0285;PRT;Methanopyrus kandleri>
LTLVLAYAGTDGALVAGDRRTLVARMDDEEKMRKVEEKLYSGEIRTEEELESFLKDLD
VEDGYFEFHDDRKKVWKVNDEVVAGEVGVRSAKGVRRRRVYATPGAHAVELEGE
KVLSKNFGGPALIVEGPKVVKELVIEFVNSELGGKPDLESRLNALDDLFEYVSSGTIL
10 VSSEYDAYEVKGKADPLARARLQKAIDEDIERLREHRRRLAEEMLKHIREGYDILKE
GVVGEVVEVGTEEEGKGVEDVPPERRIVVRLAEDVDARHMGDVVAGPGEEIVMAV
EGNPREEVEPGDRVVKDGVMMKIDGKDLPVITGYSICRTRR

<SEQ ID No.:0286;PRT;Methanopyrus kandleri>
15 MTCELCGDPASSFLRVCRECILNRWDKAREILREAHAEARRELGLPPEPPSEGLEC
GACVNRCRIPEGKVGCGVVRNEGGKIIREHAGRAYLDPHPTNCVGAWVCPGATS
RGYPKYTETRGPERRGRYNLAVFYGGCTHHCFFCQNYEHWVERERLSAEDLKRRRA
SDPDVTCVCFGGDPTPHYDQVIEIGREWEELRVVRCLETNGSLRPKLMRRIAEICY
ESGGGFNMDVKAYDPRIYYALSFSDEPYTFKNLEIIGREFAREDPPILRPSTLVVPEY
20 ITPEEVEKIAEFLASIDERIPYRLLQHVPQYHSADLGYPVCVMRECKRAAERHLENV
DACIYRYA

<SEQ ID No.:0287;PRT;Methanopyrus kandleri>
LPSEEEVLKELKKVKDPHTGLDIVSMRLVEEVNADEENIEVVVRPTNPFCSALMIVE
25 QVKATLESFAFEGVNVDVKLVGHVLTETEEE

<SEQ ID No.:0288;PRT;Methanopyrus kandleri>
LIAQVIASTTDASLVEILSGNERLDAELAFLGTPVHAFRPAEPVRHFVRNNDWSDVK
VALFCTYSLHPGKTIRWMREKIERAGGEVIGELTVKGEHPFLPLIARGHPDERDVQK
30 ARKFAKEVLRKARG

<SEQ ID No.:0289;PRT;Methanopyrus kandleri>
LNATLIRNRNPVAESTYTSLRGAKAEVVRVEREEREIHPKPPFETGTMLQAATRRLR
LSSSERVMQLAQDLFEGGLITYHRTDSTRVSEEGKRVARDYIRANFDPEDYNPRTWE
35 PEAEHVEGAHECIRPTRPADAEELRTMVREGAIQTTVTLTSHHLRLYDLVFRRFVAS
QMKPAKVLYQEAVLEVEVKGVPVAEELSGVLEIVEPGFTKVLTEYDLPAYGIRETP
ELEEGDRLEIGDVEVLERHEEYPYDQSELVEDMRERGLGRPSTYAQIVEKLFRRGY
VYVEVPQRRWIFPTTRGEAVYEYLSTHYERFVSEETTRDLEERMDAVALGKAEYQEE
MEKLYLELERVVEMPDPEP

40 <SEQ ID No.:0290;PRT;Methanopyrus kandleri>
VMNVGAREHHIDGNTVKFFGIERWDGHAPEVPVPVVAFTAAPGGSVDNVEEVGKE
VLSKGQRYPRSTARALGY

<SEQ ID No.:0291;PRT;Methanopyrus kandleri>
45 LTVLSDRDIKRALEEGDIVVKPLEEEYLEEALGPASDLRLGNEFVVFCTLHKPCIDPT
VDAGENTERIVIDEDEEFVINPGELVLAVTHEWIEINAPDITGV LHGRSSLGRLGIQAH
VEAGYVDPGWRGRLTLELVNFPMPVKLRPGMRVVQIVFHLSSPAERTYAESSG
KYHGDERPSPSKMHLDFCRG

50 <SEQ ID No.:0292;PRT;Methanopyrus kandleri>
LDLRIAHVSDLHLDSESRDKSVLEAAIERVKELHPDVVVVS GDIVKGWRPRHYGETER
IFRALDVGKLLAVVPDNHDEMRRGGEVVFRKHPYFRRKYREFTVKSPSFGELLMYPPII

LEGDGLCVIALDSTEADRS DGEVGLDQLLRAEELIREIEPEFIVLTMHHHVTPFPGLID
VSTVLDAGNLREFCVANGVDLVLVGHKHIPRVDYFASKEGGCAVSHAGTLCPEVAR
YVPPAFNVVDVERGEVVQVLEYREGEFSEPKLMGRFRIEGEHLRPVELGYDPSKA
WMRGY

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<SEQ ID No.:0293;PRT;Methanopyrus kandleri>
MGLDYEP SHLMFLVTVLDDRDGEVLGDAIQKLIEREEVLACHAVPCVTKKNRPGHV
LVVLVDGGEDPDRVAEDVARDIMVL TGSTGVDRFDADGVYSVPSRFEDVRVYGE
REW RVSVKIAETEEGEVTVKAEFDECREIGEETGIPPREVKAMVEAAARVGGWVD
LKEREIKVQ

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<SEQ ID No.:0294;PRT;Methanopyrus kandleri>
MDEYLRF LQMLVLSAAVGMVVG LEREHAHIARRIAGFRTFTLIGVLGGLTAYFYELG
CVPIATVTSVGAAALAVTMYVMRVYQRRLLGIVTPLALLATFAAGALVGMERFKEGA
TLAIATAV VLLSRARIHPVLRRLSDRDVLDALT VFSLAALVYPLCPPGPVDPWGVNL
RRVLEIVLLVLA VTALGYLGVRMSVRGGVLT TSLVGGFVSSSATTATVVARFREL PW
VPAAVVPAATSV AIIRNMILVA AVSRNLAVVKKVACVAIPAAIAGFAVAVYESGRAEV
DEEDLRRVVRGRMRSP LSLKPAVKLG LLLISGFSMTLKIGQLFAGKAGLVVGAVVGS L
ASSNAMSLSLAYMVNSGT LSSSTAGILIALSSLESILVKYLWTAVFGKREVLERTWRT
LLPPTIAGIAGFGVVL AG

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<SEQ ID No.:0295;PRT;Methanopyrus kandleri>
LTEFWARCYALAAKSLIEVMRTKSYPIQYVLRKTLSEYDDKTQSVTRSMVYDVLRRY
GTLERVVEDVSRSELPLERALVMVAANEVLYEGKHPAPVTD SATRAAKELGLNHR
RVHGVVADLEEYERPEPEDEIDRLCLEYHHPRW FVEKFGALLDEDELKELMEVHNE
PPEYYTFRVNTTAADVEDVLREFEEHGFEVERGEYVDY CIRVKKGQPLRLEELECW
REGHIVPQDEAAALVTEILNPQPGERADLCAAPGGKTT HIAQLTEDEAEILAVDVSR
VRLRRLERFAERMVFENIEVLRADVRRLGRNPRYVGK FDRVLLDPPCSSLGT LRSD
PDVKWKIGPRDIRELALKQRQLIRAAARLLKPGGV LVYSTCTITPEENELVSEAIKR
DRLRPVDVRSEFEFLHPPLRVDGVSSSLEAGRMWPHVHGTTGFFVAKLKKLT

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<SEQ ID No.:0296;PRT;Methanopyrus kandleri>
LRSVAVAGDLDRFGEVVEERGWP EYSPNPATGLLTELVERFLT KFP GAVAVKGPD
RERGTEEFVVEIPGGDAFLDEILEECERIRRRFEREFKGEVTISLGVGVGPAPSDRR
SFREAESP VRRALREALREAKRRGGNTIVVRG

35

<SEQ ID No.:0297;PRT;Methanopyrus kandleri>
VAKILVTDPIHEDALRKLEELGEVVVLEDADEEEEIREHVRDADAWVVRSGTRVTRELI
EEAKNLKVIARAGVGVDNIDVKAATERGIIVNAPESS SISVAEHTMGLILALARKIPQ
ADRSVRRGEWDRKRFMGVELAGKTLGLIGLGRIGQQVAKRAKAFEMEV TAYDPYIP
EKVAEELGV ELVDELEELLERADVSIHVPLTEETEGMIGEEELKRMKSSAFLVNCA
RGKIVDEEALIKALKEGWIAGAALDVFAEPPGEDHPLYELDNVVLTPHIGGSTGEA
QRAAGLIVAREIERVLKGEIPENVVNLPLAGVPDDVRELMEVGERLADAAAQVLEER
LRWVQVKVGGELEDREKEALKRAVLKGCLDRVLTEPVTMVNAVDVAERRGIEFEFT
VSDELEGGEVEVVRSDEDEISLRGELVEDRVYLT SVNGYEVRFKLSGPTLFWWHV
DRPGVIGEVGIILGEHRVNVAAMEVGRRERGGGEAIMVIRMDEEPPEECLRAIDEVEP
VRRVELVRC

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<SEQ ID No.:0298;PRT;Methanopyrus kandleri>
LIESHVPIPSDPVERIRALRVLREVHRRKRKPSLEV TYRTVSGSTCGPYVARWRRD
SKFKHGRTLYLGK PENESVRFVEWLVS LDRNEVLELARHLMRNLRSVLKTLLTGVS

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DLPYKRARRVLARGLALTFDARPSESPRIRDVLEELPDRLESFAIRTLGGWPAHYSA
HLRKVIRHRRKSLDGKHEIPDVKLELERWKL RHVQ

<SEQ ID No.:0299;PRT;Methanopyrus kandleri>

5 LLPYLVGLVLALTPASGEPLIQGSLSKDLEFLHEYFQKRVLPKWKDDPHVIVDVVQY
SESAGYVIYLPKENLFAFSRVQESVEPGRVRVVLPTCGRPVAVEERLEGPAVIASV
NQCPLTEGSSANLGLDVVGDHVC SFGYVTNPALGAPARCEYVLTLSAGGRVVD
EEGLGSFDPVDVEYEVYSDRVVMRILGFPEGVEDLALVIDATFDLRKGRILVDRRES
10 TDSELVSKLRELRARWGTPPGEGIEGFSGDLLRTRSGAEPLWVG FQLSHDDPLVR
FVEKVIGMYSQGASEKELQKVMGEHPNVEFLFPERNGESGTSKIPFWVLPLLPVPL
AGRRNDA

<SEQ ID No.:0300;PRT;Methanopyrus kandleri>

15 VLGPLIALVSVVPTGAAADHVTDVTSKVNVDGDYEACKDLLVGVEVYDDQGYVIAS
CCWDGRC DALGETKVS ENHLSRTVDRFIVKMTVRYKNQLLLDERVFIRVIPGQGVII
EFNGRTIELRSANGTWGPPEELRVVRTIDGKTVGITFRPSAKVEHAEQLSNQWVVD
FLYSIDGDVIVHDKKGDYHITFQAHVKHTPLKNAEHDYMQTCPYGGKKTVDEELTHG
TFGHLVDDHATKIEDLTRAWANEKMPVNPLLPALAAVLSLLGIRREY

<SEQ ID No.:0301;PRT;Methanopyrus kandleri>

20 VESVYFTLSLFGCLDVTSSVGPRLMKDYGKNLAGESFLNRCWNPGCSSTARRGV
QVGGSGRRARGVSSDPPQGRSRGRRARSRLPTNQNGIDHPRHFSEVARELRGE
SLALKRRTPFDFEFDVLECRG

<SEQ ID No.:0302;PRT;Methanopyrus kandleri>

25 MVPAPLALVLSTLLTVQPANSLQWKDCPWQLGRLSCATQGLAVDYPYDLAGDHLL
LVSPWLPEGDHYRVILAAYGVEELPLPLGTRVHRVFPSEVRRVPWKLWEQIPESP
RPATFGPWSEVRYSLREWGCPQGYVFDPDWDWSELQSSLELAVLLEPERTVDG
VFAVEASLPVREDRIGKERWIRLALTPGRWLVLWGWTEDFDVRTPCRTLFRGGAPY
30 DEAEYGLDGVKLRFWVAEYLLDLGGRARIPPSEYYSSVAGLFDLNLPGGW EFRP
GLQHEHRLYYGYGVLLVRADRS LIVEFKAPEAGKRFRSADTVDQWFLSSRYIARH
SHLLEPLRKILRGSRPDGT

<SEQ ID No.:0303;PRT;Methanopyrus kandleri>

35 VSMLNAEPKWFQWVEGCDWAKYLATRDTPIVDWTGELIGENWRANWVRAAKYILY
CAPYKGD SVEKVRQAWYGSITLEGHVPDKGAPAKFGEVDWSDKRPDMRYIGLAFD
YFDPVFDLHVPEDLRRTMRRLAELMVGLGKVSEREYAESILKDEYMPPRS GEPSR
SREYEIRNGQYWLPGEWCWITLNGTSLYGKVAKSPAQPFPNAGEAERKLMNNNP
MFQAAVRLAYWVATHIPFIGWFNWFPLAGYCGHLSPMYYEGPAAPLLFPDEGWVC
40 TDHAVLTVALYRAAGIPGYVGGELEPFGDHSWTAVRRR

<SEQ ID No.:0304;PRT;Methanopyrus kandleri>

45 LEITHGRPYDEGSGWHEIFIDPTGPMMHKPKWKIRDSVVLVPKHKPMNDDEYACASS
QRPYDMLSEAVRDAISR FVSPETMERLKI AWDGLKGLSIGLMMERFIYTNFLTAQGV
SKLIDKLFFGGNLEFEIGNWFDVR RFPGWDA SEDGVERRWR AFKSEWARWRVK
EREPKKSPTIWWIILAGSLAPLAWFRGARGVIR

<SEQ ID No.:0305;PRT;Methanopyrus kandleri>

50 VEAPWVMDPELYQSHTVQFEGSGIPPARPSDPNAFQADRFLLVAPLWNEEGRHRV
IIGAYRTETVPLPEDAKVCRVLVPDRVEVVETDNPFS DERGDP AWGILSAPRHFKKP
VPTGPWHEVKYLTLEHDGILLIRPERTADDIFAAEADLPTRDGWVRIALTPGNWLVL
LGWSKEFNLLTVDGKTVFRGRVPYNEVKYDL DGVSMVFWYCGY AIDLKGYKWFKD

VFNSGTSRECWMLMLHYIDNLVSSKSNKASTDILNFHPLLQYKIGILYGP G IILRINTRN
PIIIIEFKAPKPRDYIKYGYKEFYSDKYWSNSLSPLEVIVSQILYGVICPVITPPILLIHR
RR

- 5 <SEQ ID No.:0306;PRT;Methanopyrus kandleri>
MDGSSGLSMCFHLVHEIGRKLDDVEDIVDDAIRLCDEFLLQDKLDVDEFKKRLDDMLT
RGGGIVGNSGDVKDAAYSIEQAVEATVARVSDLLEKWSREDESKARYERLKDKLEG
LRGWVFGGLALSLLAGVLVQLAPQEAKTTLLQALSAITQVLAVVLQLVQVLHGLLPV
PISA
- 10 <SEQ ID No.:0307;PRT;Methanopyrus kandleri>
MAEVRLEPVKEVSPPLL RVVRKGV EERELVINTSKCAACGICEAACPVGAISVAPPS
AVVRKGEDPIDVDESKCVLCGICAFVCPYDVIQLLVNGKPMTEAGLPNLPKSVEVDE
EECVYCSLCADTCPQEAITVEREVPTPGDLVMGEIEIDEEKCIYCKACEEACPADAIT
15 VERPKPSAADPEPEFTIEVDEDKCVYCGVCMRTCPVDAIKVGC MV CYGTTT RGEIPA
KGEVDGSVDVDPSSCVYCGWCGFVCPVDAIEVIKPYEGTLEVDDEECVGCGLCVE
VCPCGALEFEKGGKAGKTKIVAHPETCAYCGACARACPVNAITVWREGVTAMPPELP
TKAWKKALDRVLGPVEKE
- 20 <SEQ ID No.:0308;PRT;Methanopyrus kandleri>
LTEASFDGKYVKRVFGVPDEVVDGAVVRAWDIIRERRSKGRVRIIRPDEVWPIGRA
VARLASVARVSVRRVKGVECPEDALDQVLGDAEPSSPALRTLRLTRGRCTIGFPV
LTPELTLVWVGANTEE LSSSVLDLTHHPAVRTLVS LAVLDDVGEYLVDRYDDRAEQ
LSEALQRAYDGRGARLLGLCLCAWLSEKLGGEFETWWNEG G GWRALYSV VRESE
25 LVESTVRERVGVEPGK
- <SEQ ID No.:0309;PRT;Methanopyrus kandleri>
MPRARGGCGLPSREPAAPFLVGFTAYKGGTGKSTVAFNVGLEFARYYQGF DGVPR
RPVFFDLD PQGRSDEGGRTLKKMFEDGPFRRLRSLH SPIELDVQVVEYDPDEPVP
30 VDG VNGSFGSYGLVDSASFAPALLAVPKNIIRIRRVKPLRRLAAANELLFQYLEDR
GSLDSKLREYLSSPPLGVVDTPPMNAASDTFAGILTQVDLVIPVDPENVRQLSLFC
KLYVTRLAVVNRVPPDGLTREAKFFDGV LNRILNKIPLNKDEVVKIPERPVIRFASAL
GIPVRARPDKRHSGYFREVARHIRADWNRRRYGSGVRI
- 35 <SEQ ID No.:0310;PRT;Methanopyrus kandleri>
LSPTSSSGSASPSAPDARPD RGFPPTFTASRPTSRPPTSPVSSTPGPPSPTAPPTT
PRVTLTMTSPARHRDGLAAFMRDVL DLLVTLGVHAVATGPSGREYLRTHLHIDGDT
HVHGFLT DVGFPYHTRKRREAHRLGTRLDHRIERLRAEPVSDPPEPVLRDPGLPDR
QGTYLRRRGLLP IALDDHKIPLLARVLGYALGDGSLHEIDGQLRLTFAGEPEGLRDLA
40 DDLATLG VGTGLRRWDTKDMVELHVH SRAFA RYLELLGM PRSPKVERVYGVPGWI
LRAPPGVKA EFLAGLFGADGWLTGSDGRYAIGLTQAKSAVYLGSLHLFMTEIGEML
EEVAGCRWGLNRERCYTTEDGKVRVTERLFICGREDVMRFLSDVGFAYSRAKAER
TERALKALGGSVRGIRLKYREK
- 45 <SEQ ID No.:0311;PRT;Methanopyrus kandleri>
VGRAPVLVYRGAGHVALHVVRGGAAGWGIVHAGEPV TIIPGVVAEE
- <SEQ ID No.:0312;PRT;Methanopyrus kandleri>
VTTQONGKPI TLQPF TIPRLPFRARRPHRHGLRTVPHALHPARARSHARLHPRRDR
50 GPLSGQLLIARRVLFYPPVPTTLQAEIERPTNYRLNGKQVSFWVPAPDVKYEVRS
MVKANGQLSFQHVQGVSERQGIVTVELQGDPEFVGVLLRQPPRVAYGVRDRVRLS

LRGRGPAARGVKVSWRADGERTRIELSGSGRVLLGLILDGGAMDVRVDGGSVLET
GPCRAGGVTRSWTWVS

<SEQ ID No.:0313;PRT;Methanopyrus kandleri>

5 LLLPALLTLLLLPGPVAGAPVDHAVDLPSEGSVSGGDLDRECVEAVLDSCSSVRWC
VVRAPGVVEEGAVFERCGERWVEVSGDCPGRCGVLLRGLDAARVSWASGTLRV
GPVGASAWLLVPDPRGLRVGGTFLQGGAYPEGAGVFRDRRVSVRRGRSRCPGR
CRLGWLASRW

<SEQ ID No.:0314;PRT;Methanopyrus kandleri>

10 LYGVHSTFEDVAKAAIPKFRTTPGRLLFAGFMAGAFIAGFTLATVAACVAKCPPYV
MGGTFNKPLFKLLLGAFFPMGLIAVVIAGADLWTGNVQALSSAKGMGYADWRNVIY
NWFGSYGGNFIGSIFLALMAIPLTGLFGKVGAPNLFQGTAIEIAKAKVAKDPISLFFLG
15 IGCNWLVLNLA VWQAARVKDGAGKILAIXFPIFAFVAIGYEHAIANMMWVIPTGIIASHYKI
TWSQFFHNLMPVTLGNAVGGFLFVPFYWYLSHPELSTKR VYKELLDFVAVTILFFIL
ATLIPAGIAYGLDAALHKASMYVPTVLSAYYVAGTFALRRLVKK

<SEQ ID No.:0315;PRT;Methanopyrus kandleri>

20 MAMPVVLRLDPWCGTVVDCHDESGERLTRVFVDVTDVKRSQVKRADAVIVTHPY
RDHYGGVPRTGPEVVYSDEVTAALLELEGVDPGRLERVKRCFEVGVFVETYPINH
AVPEARAVLLEADARALITGDWCALGEHPPLXEQVDDEVLDLVTEFTRAASVHPDD
LETAKARLQRLLLEHRDERVLLLNPVNPLVGAAAETVHVSRXDEHAVNVIRRAG
AHPGGADVFTDRPRYPLLLSDPRLIEERLPKEPKVITERWFLYRSRKVMRELERS
25 VPIYYVSETGHATESEIRRLVEELRPRHVILRHGPLPSRAVVTGSWFGRGRSRSW
TFRCG

<SEQ ID No.:0316;PRT;Methanopyrus kandleri>

30 LINEVYLVDGCVKAYPSELYLTWSRGAVANLTREPIEQKPQEWSSMLRLTAAKIAP
VLKLLCVLPALLELIKQST

<SEQ ID No.:0317;PRT;Methanopyrus kandleri>

LKRSPVAELFPEAFSELTPKEGEVVANPARQEEPVLFEFEGLRKSFEAMRECLPK
DGRLTVMFTHRELRAWDTLVRALRDAGFRVNAAWPVHTEAQWSLYQRDKAAARY
35 TLILACDPWEGDGEV

<SEQ ID No.:0318;PRT;Methanopyrus kandleri>

40 LGVFWTGAGGPVRVVGELVAEDLVPTTEEIPKYDSERVLSKGVDRFYKLFNERQLLV
HAELLGVIRELCEGLDEEYREPLTVYAMIAFDKMINYNTICSRWHYGRGAVVGIFDQ
HAYAWSWDHGMGAVPGWWDFGVKGVLEAYEEFIRLLRGVKERPRVILGDARKL
PTLLEEKPDITIVDPPYYTTSSTPSSPTSSTCS

<SEQ ID No.:0319;PRT;Methanopyrus kandleri>

45 VQLLKGRRLRSVVIKVGEEPGDRERREALKRAMLKGCILDRILQEPVTMVNAVRVKDSH
PPELVVVEEA

<SEQ ID No.:0320;PRT;Methanopyrus kandleri>

50 LPGRGCAHDEDPGHGPVHEDALRKLEELGEVLEDADAEEGLRRHVRDADAWVVR
SGTQVTRELIEEAENLKVIARAGVGVDNIDVEAATERGIVVNAPESSISVAEHTMS
LMLVLARRIPQADRSVRRGEWDRKLFMGVELAGKVLGVIELGRIGRQVAKRTKAFE
MEVIAFDPIYISSEVAEGLDVELVEDLDELLRRADVVTIYVPLTDETQGMIGERELKLM
KESAFLINCARGEVVDDEALVRACSC

<SEQ ID No.:0321;PRT;Methanopyrus kandleri>

VARMRFVPQVCPFCGCGCGILVGTGDEEIKLLEPWRRHPVNEGRQCCKLWELPEA
VQKDRLERPVRMTESGEPRELSWNRALIEVAEVLSTHEPEEVYFVTSKATNEDN
YVAQKLARTLGTNNVDHCARLUHAPTVALSELLGSGAMTNSIPDLVEADCYLVAG
5 SNTAEQHPIVYRRILQGLEENDADLIVLDPRTQIAELADIHLQVRPRTDLIVFLYMAK
VIVEEGLHDGTFIEERTTGFESEFEEYVREAVSEGVDVRRRIAGVDPEDVRKAAVRYAEA
ERGCILYCMGLTHHDIATRTRVRLCALALLTGNVGRPGTGVNPLRGQNNVQGACDV
GALATHFPGYRPINTETANEMSKIWSFEVPDEPGLKLTAFDADEITVMYVVGENPA
VSEPNTRHAVEKLESLEFLVVQDLYLTETGELADLVLPAAAGWAERTGTFTATDRRV
10 QLAEKAVEPPGEARPDWWILEAVARRLGLKGFGHRSPPREVFEIIRRVVPQYRGITY
ERLRRRPGGIHWPCPSEDHPGTPIHTEEFATEDGKARFPKPEDVEYREPERDVDE
EYPLILTTGRVYAHYHTRTITRRSRLSEEVPESFVEIHPKDAERYGVRDGEVWVET
PYGEWRCRARVTDVRREGTIFTFPHFGENVLTPHDVRDPESGIPEYKYVPARVRPD
SRGSASRG

<SEQ ID No.:0322;PRT;Methanopyrus kandleri>

VSSVEVQVGGCYLARSSDPDTVKEAACGGVVTPELLRHALLREDLVDDVVCVERGAD
ALDGRPIVVDDPAEVPSGSYHCAPTQLARLVAELHREDPTLRVAVTCRPCDARTLD
RLAERDLVNPDRVYRIGLNCGGTFEPRVLEILEEHGVDPLDVEREEVVKGHLVIEL
20 RDGEEISVSIIDELEEQDSGRRENCRRCDENIPERADLACGNWGVPPDLQGEWTFV
EVKTEDGRDLLAGALDAGTMEVQEAPGKSVQIRAKIDEVMRKMARSWREKTLDED
WLTEAIEALDRCIKCRSCRQVCPVCASCEEGCWSFAGRESVTPTPVWHAHIAQCV
ALYCVCEGCACETACPAEIPLTRIYSVLRRERLPDVVERLAEPAAE

<SEQ ID No.:0323;PRT;Methanopyrus kandleri>

LRAGLFRERDHRDPFRRCAQGRRPTRHRLGDVRAVRYLRRLVPVRRDHLLIDGE
PVTERGVPKLPKNVEVDEDRCVYCGVCMRTCPVDAIQVTKPYQGHIEIDDEECVGC
GLCVEICPCNALEFGRDGTAEKTRIVVNLDRVLPTEKE

<SEQ ID No.:0324;PRT;Methanopyrus kandleri>

VAKILVTDPIHEDALIKALKEGWAGLACWGVGDGEGPAAVLREAYRRVDVHPVRGVV
ALAVLEDAAGVLLEGLGEGGGAVVGVFPSPGVERAIGSASRSVPLRVVVGAVGGVR
GVVGGRRERLAGAVLSDPSE

<SEQ ID No.:0325;PRT;Methanopyrus kandleri>

VYRTSSPGREEVLELARQLMRNLRSLKTLTEVSDLPYKKARRLLARGLALTFDAR
PSESPRIRDILLEELPNRLEPFLVRTLEGWPAHYSAHLKRIIRRRKSLDGKHETPGVKL
ELERWKLGHVP

<SEQ ID No.:0326;PRT;Methanopyrus kandleri>

VRIVDWCALDPRAYDEGRRRVAARACPDQPYPVWNGEPLVFQTPTLIFGDRGDGK
YPIAWLLKIQAPSDKRITELDFPERWWKGGLLWILAITELAEDGRYYSVFPEEDLLW
DPYRREGCPYTPHSDLDICTRLGVFPALRYIDKAPAPTPDMLWKAYVRGVPPDD
GVTTDFGSLVHGTQWYTEGVSKATEGLKLALSALTALYDSAAKQAEDLGLKAYRA
45 YPAVVQGVVWSSDSSQLLIYQPTLGVSFYDPPVLVRALNSYASALLAAEDLVLRIA
LGRPQLAPWQCDDARLENQLREEFVRKVNEELGLNEATVRDFTEAIDRGKEDFESF
LKRTGVVKVDAEVETALSTLLARVCGLSTEATVYTYYSMATGEILPLVITPRALPSKG
GVTTGSFCSTLTDNLRKAEPGFTASDDLSTFKYYFNNPLINGAMATLLSWGIEWAII
LSAGLIAGPFPAAAEELLVSGAPYLAALGSSAIMALLDGWLNNRTWDQVSEEIAGVAA
50 AGTAVYRSVGRYISKISEYADTTASKIARYYDFSFNWSANSILAATSNLWLIGG

<SEQ ID No.:0327;PRT;Methanopyrus kandleri>

LPLALIYIFFASVWLWPISVAIIAVKWRRARKILNEAIGSGTVGPYGGVNGETGVRLLS
TKVWVYGGIFDFPPIGLPVVALLSAVALGKGWENLTACPGIRNLSMSLLTWVFNCS
LLGIVGKLVWYLRKRLDVKFIAESKKKVNRNIKKICEKYKYIDVYSAFNVTLMWVY
NIFAGGIIVSLFTLIFYLTNTKTLLIHYYYNILTVSISLVILTNSVLIGLWFSRRKYICSPK
5 IQSNSIIYLTIAVTIYTSVISCAMFEYVITGSL

<SEQ ID No.:0328;PRT;Methanopyrus kandleri>

LSDDKRSYARPLGRTAMFVVASGGYYQLYWFYRNWKDFKEYLGRDNNVLRITGL
FVPFVNLYLVWKQFVEINELLEAGLDPCPTKILYPVWFGFFFAGNRGIFHAETRVD
10 ALGAIVALMVSCVPLL VQKKLNEYWREVQGGLTPTWSVQGRADGGGGVVPADM
GRVADLGVNARSRRTDSGEPRAET

<SEQ ID No.:0329;PRT;Methanopyrus kandleri>

VPLLTSLVEGEWAPSHDPRMGGLGLAITGLLFLLPTMATAEVVWGPLVTLVTALNA
15 WYAVKALSSGPSPLVPLALLEPGLAVLCVCEPVRTWLAGIPKLVAGALICLEGPVD
RLFRVDEVSDGDARADAGRSPIPTGSA AHLTSR

<SEQ ID No.:0330;PRT;Methanopyrus kandleri>

VLGAALAAILLVLPGSALADAWSPVSKVHLTERTELTDQNTVRAHLTVEVLGYGL
20 EGSTRVPIKVLVPSDAELVTAKWKPERGGEEVEPVSVRTVTWPGNRDQIEWVTY
NLHSGSTPYMDALEALFPNKMIRWRELTFVLPVEGTGGYDEQLGTLEVTTCTHE
GEQGTYFAWPIAAANPAYEVRVHGLSVGFVAVYDPETGRWRWIVPGEWSYSAP
PSSRSANVNTVIVDVAGLPFGLSVEAGGVRVDPGPTWKASRFLSLTRYLPVLVMEI
SPVGPAPQRGETASERGTTTESTGGIVPTPLIVPIVVR

<SEQ ID No.:0331;PRT;Methanopyrus kandleri>

LVGSHVPIPHDPVERIRALRVLREYRRGKKPSLEVYRTVNGSTCGPYVARWRR
DSRHKRGRTLYLGKPENKSVRFVEWLVS LDREEVLELARQLMRNLSVLKTLTEV
30 SDLPYKKARRILARGLALAFDARPAGSPGIRDVLEKLPDRLESFLIRTLGGWPAHYS
SYLGKVIHSRRKSLDGKHEIPDVKLELERWKL RHGR

<SEQ ID No.:0332;PRT;Methanopyrus kandleri>

VPLNVSRYFALAPGTGVSPKELVQWLLNSPPEVTIKETCFGAIADGPEDELRLKLA
RAREEFGYAVFSKVRGYPAGDPRVCRTRGGGPRPGFPQLQREVELLDLIAEGLR
35 ALDKGEEVELEEREPPVSADTIRKLA EELN

<SEQ ID No.:0333;PRT;Methanopyrus kandleri>

VTPLSTVVRAPATIANVGPGFDVFGLAVDGFHDVVEAHEADGVRIVTEDPIPTDPER
NTAGRVALRMVEEFDLPGVSLERKGVPMGGGLGSSAASAVAAVAIDREFELGLEE
40 SELLRFAAEGERAAGEPHYDNVAPCLLGGFVIWRFEREYVRLEVPGDLRFVTVTP
TGVVRTTEEARLALRERPPSLDDVNNLSAVALMVHALHEEDAETFARMVGWDRIS
EPVRKRFPVPRYRELRETAYGTGALGFAISGAGPTVFAVCWREDAEDVRTALEDVLD
GKCVSAVHRVSDGA EVA

<SEQ ID No.:0334;PRT;Methanopyrus kandleri>

MNDLLDPIRGIPVDLELVRRELDVDLPTARYLVRTGLITTDGARVLRRGPTTGTCATA
AAKAAAIRLLEGRTVRTVRVRLPVGTVIGVRISRVGGDPSEARVRKPGSDDHVDVTT
GVTIAARVEETGSEGVEIRAGRGVGETPSGKPAISEAVREQIVDNRLRYLVDSYGVGL
RVTIEVPDGEEIARKTLAHRHGIEGGISILGTKGLVDPNSEEAIEGSIRSDRLRYVERVP
50 CLVTGYRTMDRARRLGIPSRDIVNCHGRYDLALEAVKTGVPADGEVKRFDVAVLIFG
MPGKLLKLAAGAYNTHAKVADARRESLVTRLVEIGRPDLAVEAARHEGLISEFLRSL

DPDVRRELFERVCCELVEERVSSDHDLECGCALYFRADDSEEVVEGEGWKRLVRGY
DDDLIGRPKG

<SEQ ID No.:0335;PRT;Methanopyrus kandleri>

5 VKPVSAFKTLTLRVYWDEARFEVLDQTELPDREVVRECTSYEDAAEAIENMRVRG
APLIGAVAALGAWVAYERDEDEDYGEAIERLRNTRPTARNLFWALERMEEAKNPRKEA
ERILREDVEVNRELGDHGAELLPDECTVLTHCNAGALACVDWGTALGVVRSVFN
MSKEVEVIATETRPVQQGARLTCWELSRDGIPVTIADTAVGYVLASGKVDIIVGAD
10 RIALDGSVANKIGTYQIAVLADRHDVPFYVAAPTSTIDPETETGEDIEHRSEDEVKN
VRGVRVAPEDVPALNPAFDVTPPELIDAIITEKGVVEPQEVADLV

<SEQ ID No.:0336;PRT;Methanopyrus kandleri>

15 LFILVTSNFLSFNRYTVTREELFETGYNLVTKLLKDPPrPYHTVKIRVNGKKGKVLTH
AGEPVLVVFAGYPGVSEDAKFVEMNGKEEAIKPGSTVNLDWEDPNEVLSNVTGFF
AGSRYHYEQSVVLGASLTLSTVLPEDLIERLKELGPPKKLPERAGGEELKVRRTS
SEGILSSIRLLLLRFRQ

<SEQ ID No.:0337;PRT;Methanopyrus kandleri>

20 MNRLDVMILKILAEADRPMSGRIAEIEERFGEKYSTRSIRYRLQKMEERGLIRVR
RNDRVVGAITEWGLTMLKTETSSERVGMYSISLIEEMAYRCSFDPEVMKGKVVNI
SVVKREHLDDFLDAVVETYRAGISPSPLVAVKEDLSHDHVEVGEDEVAVLTVCSVTI
DGVLINRGIPVTPVCGGLLYLEDGEPLGMQEYIKYEGSTVDPLHVFVAKGMTQVER
VLETGTGLVPANVRYVPWAALEDVEHVERELEKADIRGIVDVPKVEGILGIPLPPRS
25 LGIVAYGGLVPVALLERGISTRTYPTRTLVEYSSLEDARRY

<SEQ ID No.:0338;PRT;Methanopyrus kandleri>

30 MPRRLQNVYKVPGRGRHQLRIAGKSIPGVSPLADEVYTVDFKKRQKENEKVEKV
MEQVESKDVKFVRLQFVDIHGFVNFAIPAERLEDALVEGVLFDGSSIDGFVDIEES
DMIAMPDPDTFAVLWPWPREGKVARIICDVYWPEGKPFEGCPRLNLKRVNMNELAEK
GYMMYCGPECEFYLLKQDPETGEVEAHDEGGYDFDYPLDRAEDIRREIIFAMEEFG
LEVEMSHHEVGPGQHEIDFKFADAVTTADNVISFKQIVKAIARKHGLIATFMPKPIYG
ENGNMHHVHQLSWDPEGKENLFYDPDAEDQYYLSDTALYYIGGIMEHAHALCAVC
NPLVNSYKRLVPGYEAPVYIAWSPKNRSFIRVPAARGKATRIEYRSPDPACNPYLA
35 FAAMAVAGVDGIENKIDPGDPVNENLYEMSEERKELGIEHLPENLRDALEAFKED
VVQSAFTDHIVEQWLELKWEWSEYRERVTKWEIKKFIVY

<SEQ ID No.:0339;PRT;Methanopyrus kandleri>

40 MFPRTLIPILISAILLATPACATDVGVFAWGSTIRSEGVQKFTDDILSTGYTEVAVLIRG
VSTPTRVDTLSAVYSQIKARNPNVKVYAWIVGFERKDGWDKPWDPEVRREILDAVR
SALPYCDGIILDDSFYPTSNPVKREKAMQAITDLVREISELAHSHGKAVYFCLPEK
PEPYSIDRDAIATYVDKFIVEAYTEEYGRDDEWPVRVYNLYERLYPGKVAIALHELNE
SRLAHQLTLLKEAGCPDIWLFYRYGEVKKMGLVRDVIRSITGSASGTSLQWSPVEGG
QFDLAGLLLTGLVLGTGGGLVLAIVNPELLNSLGQAAGIAETAQELLQGAFAVSGA
45 LSGIQEKVLGASAEGLGPIIGILARVALVFVWGWLLATLLSII

<SEQ ID No.:0340;PRT;Methanopyrus kandleri>

50 MDRSGYRGRDERPASRILWMKIEPGTDSVRVFTVRFRGRPDYVAAWKQPDRT
GADRSVVIVLSTRGCRWFHETGGCVFCSYPLEGAGTRVPPELLIRQFERAYSRRHP
DSPHGKVLFTSGSFLDPEEVPDEAVREILGRLAENELVTEVSFESRPEFITDERLELI
TEVLDGKSFEVGIGLETSDDELASMNKGFSFREFAKAVKKVREYGGIPKAYVMLKL
PFLSEAEAIRDAYMSCVDAHLGCTRISICPTTVHRETVLEKAWRVGLYRPPWLWT

CVEVARKVKGTLGDRVDLLVDTSGAGTPRGPSNCPRCSSRRVARALREFTRTQDIG
RLEGLKCSCLAVWRTHIVC

<SEQ ID No.:0341;PRT;Methanopyrus kandleri>

5 MLCAGNGGKELPRAKVFEGGSLVSKDYEDLKRRYFGTEHGNVFLDPFETVYLTEK
GEIDPETPEGEPMSVEELLSFFERRRPGFRAGYVVYRDLTERGYVVKSGFKYGG
FRVYEEDPDREHSKYVVRVVEPDTELSTRDVLRLATRLAHSVRKDFVLAVVEDVEEP
RIEYVMWRWKRL

<SEQ ID No.:0342;PRT;Methanopyrus kandleri>

10 MAEQKPYYGAWPCHPRDLVEEGVTTSSARRARIVLRKYVLGQSEEEIAEEEDISLKS
VKYHLEKAEEEGLIDYVKEKFVESE

<SEQ ID No.:0343;PRT;Methanopyrus kandleri>

15 LIDPWDVEEVDYERLTEEFGIRPIDEKVRELLPRRFPLDRGIVFGHRDYDSFLKDYN
DGKLVSVLSGMMPSGRMHLGHKTVVDQLVFYQQEMDVKYVPIADLEAHHARNM
DLDRAHRIAVEEYVLNYAALGLDLPDRCEIYLQSERKTVQRMALLLAGRLTWNTVK
NTYGFTGETNMGHAFAPIVQAADILHPQEIEGPHRVLVPVGVGDQDPLRLTRDIAEK
20 EDLIKPASTYHRFMTGLTGGKMSSSKPNTAIFLTDDPETAKEKVWNAKTGGGATLE
EHREHGGNPDECVVYELMVYHLADRIGGDEKLREIRKKCREGDIICGECKRMVGEA
LAEILEELERRREDVRDELPLLSQHPDAPEVPEDW

<SEQ ID No.:0344;PRT;Methanopyrus kandleri>

25 MIPPFQALVTCAGFEFRCVEELEDILKEQDPYAEAEPTYFKGVVVVRSDLEPEEIVE
MMKDAADTDWVAKIVPIHRTVRADLDVMKRTATILARRKLDENTSFAVRCRKRGGPP
FGQREVEVEVGAAVQEATGAPVDLENPDYVWVIEVLQDTAGISVPPDLIVSKEVK
RVRKWSPGMRPISRAQLKLRELLKRHPYIVREGSDVIDLGAAPGGWSYELARRVEP
GTVYAVDPGDLHPKVLKLDNVVHLKKRAEELTEDDIEGRILVTSDLNRIHTEATEVT
30 LSVADEFLEPGGFIVQTVKLAVDLPSTGEYAAPDVETAVSEVELEYERRGYEILAIERL
KRNTPNERTLVARKV

<SEQ ID No.:0345;PRT;Methanopyrus kandleri>

35 MRLLKAGDRIQGGPWEGKVTAVLVDVGCRVWITSSNPENVPKRVRGGGTVCELAF
HDPVGGFAAYWVEPDHSEATDVGSPEEGTCAVHIGNRWILAEVLEVGRRELSIRIP
NVAIPGPGDAGAPVAQNERVVGMLYMYFLEDDCVGRAVRMDVIEERTERALKRLR
GRQRARSIRP

<SEQ ID No.:0346;PRT;Methanopyrus kandleri>

40 VPVVFLEGPLSPMDHAYEVMARCVPNGREIFEVISFYDDVVYFEEQREGYEPGTT
LALIVPFLVHGVTEDDLRRVSEDATLTPGARETMRELDATPFVASTSYEQHAMRIA
GLVGIPRGHVYCTEMPLDDAPEPSEEERLVLEMEREILRKFYPPSDADKEELVESV
DDFFGRLSETELGEFCSKIEVVGGSRKARVVEEVVDLEDADVSEIACVGDSTVDVM
LKFVRKRGGGLAVAFNGNEYCIPEADVAVAAPSLSAVLPILETFFEEGKDEAMELAEE
FEPEGEARVLNVNRARQRELEEFIRYSEAMRERVGEAGKLG

<SEQ ID No.:0347;PRT;Methanopyrus kandleri>

45 MRGLEEKIRTLQLPTDVRWCPRMTDRSRGRRWYAVRGSDAVRVVLPVRVSRRD
FKKVPKGAGDAAAHPIIEEIKRRSREEPDLYPLSGKLLDHKKVRKLTEPCTVRLHGF
RTPPLWMPGKSNRVLRRLSREVLLTVRMLFPPDWSEERVLDGVYAALDALREVVREI
50 PRKEILRTCDVLDQRELRLRERLGEIEHRGKRVALIGDGARPARRLTDVRRHHRI
AGPKPEPHIPFEVPEDPDADLVPLEIELPRTGERKRFLPIYEGELFAIAGANAQGKTT
LVNAVEAGQDDHAPGDGREYVITVRRTAKAEAGIKRMNGEDVSLFFRELPPGYEGT

PENVRGLASGSMKMAAEIQRALEEGAKILFIDEDKAAVNLLVPGVLTKELEGIRTLVE
VRDEITSRGVTIVAATGVLDDFTAAADRAIVMEDHRPKPLNLREFRARLARYYLERA
RRYRSDAEGPEGG

- 5 <SEQ ID No.:0348;PRT;Methanopyrus kandleri>
VNARIYAAASVLCALLAASVQWDVLADLPEAWRELNAATELAHKALEEKKKGDEL
MEEVSATVNAARSAGPLALSVNAPRILEDLHGAYVHYARAVDAIDAADHLDRTLD
MIGATADPEIKESLKLMEHGVSHYRMALKEFKLGVQAADEGDVGEAFRHNAAAYR
MMREGMKLFSRGKAELESKTLLFMG
- 10 <SEQ ID No.:0349;PRT;Methanopyrus kandleri>
MYRTLTLVLSTTLMAVAAAERLDPVDEDRPHILNVYIEGHEATCFGQGIDTKRLET
GLKHVPEVPTKGEFTVTVEFNTGPHPPERLAVELYFPSWLMVPPKYDLKLPEKGV
DHPEPNSILRADLEVKVGEGPNPLSIGDEYYLVAVLRDPTKESDVL DYVVKLRFRE
15 PRGGESTPEPTLLKVTRSA LGDVSVPVAGFILGSL SALVAEIVCGWIHSGPAALWAT
VIGGLVGALLVSI
- <SEQ ID No.:0350;PRT;Methanopyrus kandleri>
MLHDPNDPSEYVIYVIDRGSSSGLRRIWGDEIQDVKRGFLVLWNAEIPVHRVIRVE
20 RGGRVIWERGRRARGRR
- <SEQ ID No.:0351;PRT;Methanopyrus kandleri>
LVSLSPEEVRRKCSEKGWVTMYERIATLTDEDRERVLLIEDHPTPVGAEWVVRNYE
ATSPLEKAWREGKRHFFLLRVGEASLDLEPSVRAAGVESVEVRDGEVRVTHAGL
25 AGAGVGAALS RGC AEGVSRVEIHEEGGGSRLGRATVVTPELRLVIGVDDTDTEEE
GATWSAVDVICRRLEDEAGVFYSRHVTVQLYPKTPHRTNRNCAAVVELGVPTKRVE
RVKREFLRMLKEVSFS DHTCAAFWDRLEFPRELRLD LGNAAKRRIVSREEVDEVVEI
CEIEVVSIGDGERGRIGAVAALPFIDDHGLAARVPR
- 30 <SEQ ID No.:0352;PRT;Methanopyrus kandleri>
LAETIVRKFDPNKWVLVPTRHALERLRKRELSPSADVPEAVHALRRLAŠTTKVLIN
DVWVAVGTERTLVLSEMRMSLEKYQDELKRHL SRLHPTYTVYVITAEGCRPTSAG
QLDVDDLATEFEYARFSGEARTLV LAREGEKALAVTVRPPRKKERKLIE
- 35 <SEQ ID No.:0353;PRT;Methanopyrus kandleri>
VGNVPRCRRCGYSVELPLKPCRCGEP SFEVAAFQVYPEDVRYVAVFNESDVHTI
HQSFQGD PDGIMLRNLVERLGELLHSAAPRAATAVRTPPWIVDVVERISGVTVRTV
RDDFD DVVRS LQAELRADRLDRVEEPERKLGGSHSTIIGGRRGRELVLKVASVP
YVKRVIPGRIGAKGSRGGGGVRLKVS RVDDSGNVKLLLSEGAATQEIFVTTARDE
40 REGKLVAELLERVIR
- <SEQ ID No.:0354;PRT;Methanopyrus kandleri>
MIMEILNRHKEKLVKLRVLSYGDRMILSAQFSANDFDEAYEMLQEIMEEPEVVSLD
SDRKQGYAVTLMEDVTEEYQEIRERVHELMRELVEGGEGKEEFPLPIFEA
45
- <SEQ ID No.:0355;PRT;Methanopyrus kandleri>
VDEKKIEELVSKVKGEIKFHEVEKYTDGDSEVATEVRRRALERLTGAKLEHLGKYTI
DANRAMDKNIENMIGAVQVPVGIAGPLL VHGEYAEGEYYVPLATTEGALVASVNRG
CSTITDSGGAHVRIVRDGMTRAPVFKLPSARKALEFCEWVRKHFD DIKEVAESTTR
50 HGELLDIQEFVGRHVFLRFEFDTKDAMGMNMVTIATEEAVNWIEEKYPDAKCVSA
SGNV CVDKKPSWLN NVLGRGRTVVAEVEVPRDIVEEKLKTTPEAMAEVNYRKNLV
GSAAAGNIGFNAAHANIVAAIFIATGQDEAHAVDGGSTGYTTMEVTE DGDLYASVTIP

SLNVGTVGGGTGVETQRECLEILGVAGGGNPPGVNAKEFAEVVAAAVLAGELSLVA
ALAAGHLGKAHRLGR

<SEQ ID No.:0356;PRT;Methanopyrus kandleri>

5 LAISEILAGLSAGVAIEFAMPAMIRRSPLRLAVILGVIAAASCSLSILWPILRPVGAVS
GLLTGILALAVRAEELKSGHFGAAGFSVRGAASYMLLISLGIYALL

<SEQ ID No.:0357;PRT;Methanopyrus kandleri>

10 MKPDRRLDVRGAACPGPSVMVAEELKEMEPPGQVLEVIVDSEGIANDIRELVQDGG
HEVLKVEETDGDIRMILIRVGGVETDSTATDGTVRTCAGSLPSTDTDSVMIAQSTGVA
NPERAYATFLMSEAALAMDLDVVIFGFMVGTVLVEREVERIRHPEFPPLIDKAREV
LRNVEACACELSIQARGITSDDLLDGVKVVGASKFLKLITDPGVDVWWL

<SEQ ID No.:0358;PRT;Methanopyrus kandleri>

15 VPTVVRIDEFWDMTEGERRSVDAVTCATVGLMSGVYGILSFHVAEPGEVRRFEEVY
LEGIRLPVGPCPNERLGLVECVVPATAHGDVSGAYLLRTVAEGNEFDVIAVADDGR
EYEATIGPEELERAMIASTRACFRNYSIAFNDGERPASTIFAPRPLEPGEASFSGCG
GYNPLEHDPKRLRLHRPGRRVLF CGAPGVITGKGTRSTRERPNTLHANLTECDPTF
20 MGEYRTSAGPENIAGVASVIAVTEETLPFLERDHS DAVLPVVKLSDRTPIAETTYADV
WVQETVRWNPDR CENC DPCRLEEKCPYPYGD LRTGDCFHCGYCHEFCPAVEVDL
GELEVEGRKLPIVARESSAYLAKKL MERAIEAVEEGKIDILRP

<SEQ ID No.:0359;PRT;Methanopyrus kandleri>

25 LASDRDDVDVLDILRETMELEEFAERLEDVDAEDETWT TSEGSRK FREDDEPRCD
REFKKKMLENAPRSSDDGYVIAERAHWLR

<SEQ ID No.:0360;PRT;Methanopyrus kandleri>

30 VVGLGWAERVVRECLRLSEGERFLVLTDP EMEELGRELF EAAEGTDRALVVVDPR
ETHGEEPPDHVAAMMRSSDAVA AVT SWSISHT EARRRACEAGARVASMP ELTREI
AERAIDVDYEELRRLSRELAELLTEASEVRLVTPAGELVMDIGGREALADDGNLRDP
GEFGNLPAGEAFVAPIEGSAEGCVRIDG SVAPDGILDEPLELEISEGRVVEVSREDL
EFVRLIRRIENGEMLC ELGVGTNPGAKLCGVVLEDEK VYGTVMGMFGDNSTFSGRV
SSRVHLD AVIKEFELYLDDELVARSGELLGVSL

<SEQ ID No.:0361;PRT;Methanopyrus kandleri>

35 VTRYKVG LADTT FARVDMASVAE KVLKEHLPGVETPRYTVPGIKDLPVACKRLIEEE
GCDLVMAFGMPGPTEIDKQCAMVASMGLILAQLLTNTHIIIEVFVHEDEAEDERELHE
LAVKRAEEHALNVVKMLEKPEALTREAGMGRREGHPDVGP ARL

<SEQ ID No.:0362;PRT;Methanopyrus kandleri>

40 LEGIRNQIERVLD PREGACGIAHATLEVLSWSGYRVECL EERLGVRARLIGPDGSVT
EGRDVTWAPAILES LIKSGVYPEGWEERLSEVLT PERDMRRLARVFGYGRVLTVD R
VAARIILGGGGTVIVRRRRLGSEVEIRYD GSKSDYVS YCPACALALAAVRHPQVYRE
LKRELADAPNTGKVKAEDGVVNSVRVRRGIAFATL KLANRSITNRGCCVAYAI VRAE
45 LKAGYGSERSKRLLRAYCDECPLKHCVGKPI SALGNVVLQRLTETEGGVRLKVEE
YPEVVT PAGTGRGTL CALSACANAVLR LDASKVLKPDPSRSEAWGDDR

<SEQ ID No.:0363;PRT;Methanopyrus kandleri>

50 MFDPKKFVEEAIEELRREIGDRKAIIVSGGVDSTTA AVLTHRAIGSHLVCVFVDHGF
MRKGEPERIRELLEELGLNLR FVEAAEEFF EALRGVTDPEEK RKIIGEFIEVFERIA
EEEEAEVLVQGTIAPDII ESERGIKSHHNVGGLPEKLNLDVVEPLRDLYKDEVREVAR
YLGIPDEIVERMPFPGPGLAVRVLGEVTPEKVEIVREANAIVEEEVEKAVEEGKMSK

PWQAFAALLDCKATGVKGDERTDYGWVIAVRIVESIDAMIADVPEVPWEVLRNIQDRI
TSEVPEVTRVLFDITPKPPATIEFE

<SEQ ID No.:0364;PRT;Methanopyrus kandleri>

5 LAFVWIPSDVVEGKCVQLVEGDPERRTFESDDPVETAHQWSEFFPWIHVVDVDA
RGEEDNSDIIGRICEEVDKQVQVGGGIRSAERAEELIELGADRLIVGTVAFTDKDDFS
KIVDVCHDHGIEVFVALDVNENHEVLVSGWKEDAGVTLEDAIERFNEVADGYLTTAV
HVEGKEMGIDEKVVEKSTGATDLPVLYAGGIASIKDKVRAKEAGAYGVVIGTALYHG
10 DIDPVALLDLMEED

<SEQ ID No.:0365;PRT;Methanopyrus kandleri>

10 VITVAVPNKGRLEPALKLLERAGIGVEEPLGRRLKARTTDPDIEVMFVRAADIPRLV
EEGVAQLGITGYDLIVEAGAEVKELDLRFGRARLVAVPEESDVKSPEDLDGGTVA
TEFPNIARQYFEDVGVDVEIIQVSGATEIMPRIGVADAIVDLCSTGTTLKVNRLRVVD
15 ELLETSARLIANPDATDGEVIRRVYLSLKGVLNADGKCLVMMNVPRERLEEFHELLP
GVTGPTVSEIYGDEDMVEVYAVVNEEDVSEVVLRAKELGAEGIIVLPIERMIP

<SEQ ID No.:0366;PRT;Methanopyrus kandleri>

20 LRLAILGGIAVTPERVIEDAGILIDEDGRISFVDTREQLEECEDWEDEIELGEKDVIMP
GLINTHTHGPMTLFRGVADDMLMKWLREEIWPLEERLDAEKCRWGAALAAMEAL
KSGTTCLADMYFFMDAVAEAYAEV GIRAVISHGMIDLGEEDKREEELKESKRVYRK
CQGMIEGLIEFSLGPHAPYTCSEELLKEVRRLADEWGVKIQIHVAETEDDEVKEVKRK
HGKRPVEYLDEIGLLGDDVIAAHCVWLDDKEIEILSKRGVIVSHNPISNMKLASGISPV
PEMLERGVNVTIGTDGCASNNDMLLEEIKVAALLHKVNKMDPSATEMLEILRMATV
25 RAGTVFSSEKIGAEIEGYAADLVLDGSSPRLNPNHNPISNIVYSASGSDVKHVFA
GELVVKNGKLVKADEQEILENSTECAEQLTSS

<SEQ ID No.:0367;PRT;Methanopyrus kandleri>

30 MTFTALTGVYSMQYGELVETRYRTLGDKTYEVPVEYYWKNNGNGHFVWVSLGVH
PLEYQAHKCMFEAVKWFVYNSGEFEGTLVWSWIKIPAEYYQSGSEEEKYRVSRDLG
QLTFYNHVLPPYVLPKELGSKVGVPIRKPFLDVHAHRPSWGVSEFILIPAGPIHG
NDNPESFQRALQICEVLGAVIGARVDTQQTGTSPWPVTAPVAKHGIPAATFENGYY
YIGQELPPNYDNYRTELDKAFLEALYLALEGGRPVPTPEGYRKLARWYAMAAETW
GRTVEYLSKAAETHPEYRSELQRLAEIAAKIRDLLVEMSEECKRVAELLERGQRDEA
35 ARLVDSELIPEYEEVTRLYDEYISGTRIPVRISDVFASEEHESGDYIEVFGVKLPVSL
AATIAGAGILAAVITFKVSVNPLVGLIACGALLWLSRRWS

<SEQ ID No.:0368;PRT;Methanopyrus kandleri>

40 LVVVKEGEYAIRDPSLAPKGRDMIEWARDHMPVLGAIRERFEEERPLEGITVGMTLH
LEAKTAVLVETLMAGGAEVAITGCNPLSTKDEVAALVEEGVHVYAWRGETEEYY
QNIDRVLSHEPDIIVDDGADCIARVHTEFPDLAERVIGATEETTTGVNRLHAMHREG
VLKFPVIAVNDKTKYLMNRYGTGQSALDGLMRATNILLAGKTVVVVGYGWCGR
GIARRARGLGANVIVVEVDPIKAMEAIFDGFRVMPMDRAAEEGDIFITATGNRDVIRG
EHIEKMKDGVILANAGHFDVEIDKEYLEEHCCEEKIDRRGGLVTEYRMPDGKRVYLIA
45 EGRLVNLAAGEGHPIEIMDISFALQALSVEVLAKEGKEMEPGVYKVPKDVDRVAEL
KLESMGIELEELTPEQREYMKSWEEGT

<SEQ ID No.:0369;PRT;Methanopyrus kandleri>

50 VRLWRLTAVMRLRNVM SRLVLALKEVEGGIIVGLLYDSN

<SEQ ID No.:0370;PRT;Methanopyrus kandleri>

VFLPEIDDRCHELAERYGVRPYMVARYLTFLGRSETERLLKHMEDIRPAIRNTILIDP
EELRRVLEEKRGFELKRCPEPVDVGFWILNDPPISIGATLEYMMGYVPQDAASML
PPVVLDPKPGDRVLDACAAPGGKTTTHLAQLMDNEGTLIAIDVDPDRMRALKSNLAR
CGVANAVALRMNALDLPSTDWEFDRILLDAPCTGEGTIHKDPSRKTSRDPEDIATCA
5 RLQRRILIDAVVDVLRPGGVLVYSTCTFSPEENELIVQYAVDEHGLEPEPVDVGWAD
RGLRVPGVPEPKVRRTCARLYPHRHGMGIFFFVARLRKPLS

<SEQ ID No.:0371;PRT;Methanopyrus kandleri>
LGALEEFWKLAEHDVPIVVRQDAVALYRVLLETVRWGIEREEGVRESRSEVRARI
10 SCEGLDCAVLTKVGEDRPQLLLRTVLGPRLLAEVFERAHESGVRSFHFDDLQGRGLR
VEGEYDVGVQIKVVGGGAGWELLEDLEKRGFSVTGL

<SEQ ID No.:0372;PRT;Methanopyrus kandleri>
VHVLIASGDGGHLTRALALAEELSDRGHDVTFVAVNEDSDQAVERLKKAGFEEYVGL
15 PRPRRMGDTSWKAALGGLKNYLAASKVLRDVRPDLILSTGAGVAIGPMIAGKFKRL
PVAHYEPTDVSVSGKVAKLCADIIGVWDEDMAEYYGDRVINVGIVLPRSFEEDPE
EAREKYDLGDRVLVWTTGSAGYKPALEGLVRCAEEGLLRDWEVVNTGNAMDPK
RLKRALNGLCSGIVVKRFFHDFPALLKAADLVVCLGGATPVEAAALGKPVVLPRRD
VLRDHQYVTAKKLEKRGVAVAAEDASNPEEVVKAVSRALSIDPEDLKRMMGERGKEL
20 FGGNARERFIDLCEELVASG

<SEQ ID No.:0373;PRT;Methanopyrus kandleri>
LGVQVGIVGKPNVGKSTFFAAATLSPVETADYPFTTVDPNQGVAVHRTECPCKAFG
VECQPRNSSCIDGNRFVPVELIDVAGLVPGAHEGRGLGNKFLDDLQASVLIHVVD
25 VSGSTDEEGRPCDPGTREPAEDVRFLERELDEWIAGILRRDWDRTAKRASLEKIPA
AEVLRERLAGIGVSASDVESAMERA EVPSDLTKWSEDIRRFAREVRRVNKPMVIA
ANKIDVECAEENLKRLEEEVEYPVPTCAEAEALARRAADQGLIRYLPGDSDFEILQE
EKLSDSQLQALEFIREKVLKRWGSTGVQEALNRAVFDVAKMIVVYPVENENKLSDS
EGRVLPDALLPEGTMVRELAYNIHTEIGESFNRAILVKPDGSREVVGEDHELEHGD
30 VVKIQTS

<SEQ ID No.:0374;PRT;Methanopyrus kandleri>
LRILALILLLSLPLTPALAEPTPSAGYSSPSEQPAQEEVKTEEQMVETSNVPPSEAVR
PSTPEREKEVTTTTSAAGSSETPEITKSEKTNEKKENRVVNLREPNPVEKKNNANVT
35 MLMGILAAALGAYSIKRKRREALVKVPAA

<SEQ ID No.:0375;PRT;Methanopyrus kandleri>
MAQNVEQQVAQLQQLQQLSSIVAQKQQLLELQLREIERALKELDEIEEDTKVYKTV
GGLLIEADRDEVKEELEDKLELTVKLEKQEKRLQQQIENLQKRLQKALQQAEG
40 GGGAGAA

<SEQ ID No.:0376;PRT;Methanopyrus kandleri>
VHALRCEAEKSERVARVYESVLPDVKLMPARRSRVDIDRRGNNIQIEIRAEDVSA
LRASASGVFRLLALSERVITTVLGDV
45

<SEQ ID No.:0377;PRT;Methanopyrus kandleri>
LRPAAITTSQRPARRTRSLCRDLECALPDATYVLRGTKNLRDTVLEALES GA EVLFY
VTEAKGNPARLHVIDLGEIPRLRLSFWLGGVKLQRELFGNRVLDLSDLVITTSKRP
VSGHMKVAESLSEVLGVEFVPRAGSLEDVLEEALADVLLVVEGHPRHLGTLTFYRR
50 TEKVGPSLFYRDFRTKDERMKL

<SEQ ID No.:0378;PRT;Methanopyrus kandleri>

MYEEKEYEYICMRGKKVRLDINEDPIRCTHCGFRLVMKPRHPVPRRYKAR

<SEQ ID No.:0379;PRT;Methanopyrus kandleri>

5 VGR TKKVG PAGRFGPRYGMRI RRRVAEIESVQRQKHECPVCHKRAVKRVGTGIWR
CTKCGAEFTGGAYYPETEAQRIVRRRAIRKALEEK

<SEQ ID No.:0380;PRT;Methanopyrus kandleri>

10 VDLDLLARIKRHEVLAAIRAGERIDGRDFEEFRPIEV RAGVISKANGSALVRLGNTQL
VVGVKLEVGRPYPDSPNEGALAVNAELVPLADPSFEPGPPDENAIELSRVVDGRIR
ESEMIDLEELCIEEGEHCVWTFVDIHVLDHDGNLFDASMIGSVSALSITEVPKAEVVD
DEVEVMEEDTEPLAINDFPISVTIAKVGEYLLVDPCL EEEVIMDTRLTVTVTESGEVC
AVQKGELGDFPEHLLEDAIDLATKKAEEVRRTVKAQL

<SEQ ID No.:0381;PRT;Methanopyrus kandleri>

15 MEERPERLISEDGLRLDGRKPDEMRLPKIQAGVLKRADGSAYLELGANKIVA AVYG
PRELHPRHKQKPDRAVVRFRYNMAPFSVDERKRPGPDRRSIEISKLSKEALEPAIFT
EYYPRTAIDIFVEVLQADAGTRCAGISAASVALADAGIEMRDLVAACAAGKVEGKVV
LDPMYYEDGYGEADVPLAMMPKEGKITLLQMDGDMTPGEFKQAVKLAKKGCKIVY
KEQRRALKEKYGGD

<SEQ ID No.:0382;PRT;Methanopyrus kandleri>

20 VPEFELYVEDRQVVTPGELLARGQVIASEGTYTSGDEVYSKVTGLVDIDGRRIRVIPL
AGPYRPSPGDFVVGIVEEVKFSSWLIDVRAPLPAILHVSNALEEEVDLIETDLSRYR
PGDVITAVVREVD PVQRVELSLLEDDAPTRLGRLQGGQVVEIDPVKVPRVIGRKGS
25 MIKMLKRVLGCDIVVGANGRIYVRAREEPKKERELLAVRAIREIERRSHLRGLTDWL
KANLKRLSRW

<SEQ ID No.:0383;PRT;Methanopyrus kandleri>

30 MGTVETLTEHLREL VGRVAPPGWEDEVREYVEATLEKYCDDVHVDTLGNVIGTIEG
SEYEVMAAHMDEVGFIVKSIDKNGFIRFAKLGIDDRILPGSRVIIVNSEGEKVPGV
VGTKPPHIQEPKDRRKVPKHKDLFIDIGASDREEAEELVSVGDVGVLAGEFVELVGS
RVNGRGLDDKIGVAVLLALAERLADLDGDHPTFYLVGTVQEEVGLKGAKTSafeVY
PDGAVLDTAVAGDVPGVKEAELKLGKGPaitvVDASGRGLITHPKVRKLLIDTAEEEL
35 DIPYQLEVGE GGTDDATAIHLTRGGVPTGVVGIPTRYLHSPA EVLDLEDAKHALELV
VEVVQRFPDYVPR

<SEQ ID No.:0384;PRT;Methanopyrus kandleri>

40 MARVSLEDAVVARLEKGGERFEVLVDPEGARKFREGEDVDVEEILAVEQVFRDARK
GERASEQAMEELFGTSDPIKVAEIVIKEGEIQLTAEQRRRMQEEVKRKIIHIIARRAVD
PRTGAPHPPERIERAMEEAGVHIDPMKSAEEQVKDVIKQLRPVLP MKFEEVKVAIRI
PAKYTGQAMGVVREFGDIEREEWQYDGAWVAVVRLPAGLQDEFFEKLEITKGDF
ESKILERESVEGP

<SEQ ID No.:0385;PRT;Methanopyrus kandleri>

45 VAVQPAQTAYDRAITVFSPDGRLFQVEYAREAVKRGTTALGIKVEEGVVLGVDKRV
TSKLI EPESIEKVYQIDTHIGAATAGLVADARVLVERARIEAQTYRYTYGEPIDVDVLV
KAICDLKQVYTQHGGVRPFGTALLIAGVDTKGCRLFETDPSGALTEHKATAIGEGRQ
EALDVFE EYREDMTLQEAIELAVRALYEASREETTADNLEIAVVDKQGFRKLERKKI
EEMFERVVGSEEDGE

50 <SEQ ID No.:0386;PRT;Methanopyrus kandleri>

VKHMVRVLSSALRPRWRYVTFKVVSEVEALDFGGMKDLVVRALLSVLGPTGTGR
IGPWLVRSYRDLNAGILRVRRGQEEEEARAALSLYRRDPKLGRVFIEVLGTSGTIKGA
ERYLSRIPKWDRERVGNREFVLYENGEVDVVEDGRIVAFASFECPLPEENRG

- 5 <SEQ ID No.:0387;PRT;Methanopyrus kandleri>
LRVSENFALRVHVDEVDPLRMALAAERLDYEIAVLCLELEAERLNIDDLRWLIEEIRDI
REHVESVLVLP GCKLEAESAGALRRRAIRRTPLVYLLAVGGGDPKINRAAVSDTRVD
LLSHPERGNPHAGLGKYEIELAREKWTYVEIDL SRLFRREGERLAWQVSRIRDLLRL
RRRKRFPTTVALGARDPLELIRPKQVEDLLKLMGFEDSEVKEMCVEAPREILRWNA
10 ACKHVFTVPGVVS LG
- <SEQ ID No.:0388;PRT;Methanopyrus kandleri>
LTLPVNSISARVIAHATEDEKKVLEALANVLGGVLEEGDVEPETFYAEGHHGNPITIF
15 QVKIDRPKYIERVLEHWRENIPEEERRRVWSDIERRVDDKGNLYLRFDKQSAYKGE
LRISDADDVIRVKVNLESYPASREGGIKTLERLGIFSND
- <SEQ ID No.:0389;PRT;Methanopyrus kandleri>
VDAVSMYKYQREAWKRPKDSYVGELLKERLPKWRKGPSVQRIKRPTRIERARRLG
YRAKPGYVVVRVRVPKGGRKSRPKKGRRPKRMGKNKFS PGKSKQWIAEERAQR
20 KYPNLEVLNSYWVGEDGQYKYEYVIMVDPYHPQIKSDHRINWICQKSQKGRVFRG
KTGAGKKARGLRKRGKGAEKVRPSLRAHRRRGK
- <SEQ ID No.:0390;PRT;Methanopyrus kandleri>
LRTEELKLKLKELVESIEDEGLRELVMKVLEEGFAHEEVPDPEPVEEAPASRRQHHS
25 YPGGLEHTVATTKLALAMAEVFEEIYGLEVDRDLVIAAAILHDLGKATSYERREERY
KISDFGRRLDHLTLIAAELYARGAPVELIHAVAAHHGRGSPVPPNTPEALIVHLADRS
DAEFATEVIKAARNVVRARLRELDVEPTDELVEEVLRRVGPSEIFLTRVREGRDAVR
QLVAETLEEIEEGSSP
- <SEQ ID No.:0391;PRT;Methanopyrus kandleri>
LPDRVRIFD TT LRDGEQTPGVSLTVEEKVEIARKLDEF GVD TIEAGFPVASEGEFEAV
RAIAGEELDAEICGLARCVKGDIDAAIDADVDCVHVFIATSDIHLRYKLEMSREEALE
RAIEGVEYASDHGVTVEFSAEDATRTDRDYLLLEVYKATVEAGADRVNVPD TVGVM T
PPEMYRLTAEVVDAVDVPVSVHCHNDFGM AVANSLAAVEAGAEQVHVTVNGIGER
35 AGNASLEQVVMALKALYDIELDVRTEMLVELSRLVERLTGVVPPNTPIVGENAFAH
ESGIHSHGVIKKAETYEPIRPEDVGHRRRIVLGKHAGRHAIKKKLEEMGIEVTEEQLD
EIVRRVKELGDKGKRVTEDDLEAIARDVVGEVPESEAAVKLEEIAVMTGNKFTPTAS
VRVYLDGEEHEAAS TGVGSVDAAIRALREAIEELGMDVELKEYRLEAITGGTDALAE
VTVRLEDEDGNVTTARGAAEDIVMASVKAFVRGVNRLARRRRD
40
- <SEQ ID No.:0392;PRT;Methanopyrus kandleri>
LKIRPEDLTDFVSEALHAVGVPRKDARTAAEVIVEGDLRGFHS HGVLRLPGYIEGIKR
GAIRPEMRIEEISRKSSVLYDADHSLGHVVGYRATLEAVELARKHGLGMVAVRNA
SHYGIAGYYTTLVAERGFIGFTTCGTEPAVAPYGGSQPV LGTNPVSIAFPRRDGPPI
45 VVDMATSVVARGKILQALRENREIPQDWAVGPDGEPTTDPEEALEGALLPFGGHKG
YALCLALEVL AGPVVGAAGKDVQGTDTVPCNKGDVFVALDLSTLVDEHEYER
LERLISQVKSAGDDVLLPGEPEFRRRERALREGIELPEGSVRVREVAEELGLEDP T
R
- <SEQ ID No.:0393;PRT;Methanopyrus kandleri>
50 MGMKRIEALRVVADVAERYDAVVTVHLGFPARELYRVNDRRLNFYMLGAMGQSCS
VGLGLALCTDREVLAIEGDGGLMMNMGVLP TIAQERPRNYTLVLIDNSTYATTGDQP

TPSDRIDWEKVAEAHGLTYFEASEPESAEEVALEDALATEGPRMVRLEVEPGNADVPLIDLDPEEIKVRFVRALREG

<SEQ ID No.:0394;PRT;Methanopyrus kandleri>

5 VKAFEKSVKIPKVDGATVMLDKGLTPEFVESFLKVAGEYVTAVKLGWGTARLIDKEI
VARKVEMYVDAGLDVFPGGTLAEIAIAQGNFEGYLNELDELGFNAIEISDGMIPMSIE
KKCELIERACEQGFTVYAEEGKKRDEEYSVLSPSDIVGRMNKCV EAGA EYVIVEAR
ESGKHGPMGAEKRRERVRLSEIVKGVGIQRMFEAPEKEQQFELIVKFGPEVNIAN
VPPEEVIPLATLRAGLRAETMGRVALDGE

<SEQ ID No.:0395;PRT;Methanopyrus kandleri>

10 LNVDDAIVEALEEAGITFACWLPCSLLDGIIRLEEHP EIRTVRVSREEEGVGICAGAA
LAGEKPALIMQNSGLGNSVNALCSLTLYRLPLMLMSHRGYLFEDIPAQVGMGKA
APKILENLNLHAFTIERPEELDVIPGAWKLAETAGEPVGVFLSPRLWRQTGR

<SEQ ID No.:0396;PRT;Methanopyrus kandleri>

15 MGDRPRRLGSRLLYAGCVLLTETVDAIMDKLKSNCDIVRVQVEDVSFHLRVHTNDA
GVSRELRLRNIREPKASKYLVGKFLNDEEIAFDVGANIGYYAILTALASERSRVYAI EP
VRENLELLRENIALNNLED RVKAF EYAVSDKCGRIRMILENRSNWHRIVNAEDGDYI
20 EVESITLDELSEKLGERPTYVRMDVEGAEEVIRGMVELLESDDPPKLFIEHHIHL LG
LDATLDLIETLLDYGLEIAAAF GYPHASLHDREGGYRPLVGEVVRWRGLDVELYEPS
FEELHDVIVEKSWDCFHVFYRPV

<SEQ ID No.:0397;PRT;Methanopyrus kandleri>

25 MAAKGELVGSKVLVRNDRDANRLYSSMYGKPSRRGLQLWP EEALFLCEIGRLEVR
SGNVRISPEELMDRFVEEDPRFPVRYAVYADLRRRGWKPKPGRKFGTEFRAFRGE
DERIAVKVLQEELDEFTAQDILEWLKLVEGTEFELVVAIVDNDYDLNYYVFS E LVL

<SEQ ID No.:0398;PRT;Methanopyrus kandleri>

30 VTVGRRLDAFLRDVGLAESRREAKRLVESGRVRVNGKLVRKPWWLVSPGDEIEVD
GVTVRVEDNGGERRVSRIEGARSE

<SEQ ID No.:0399;PRT;Methanopyrus kandleri>

35 MISRVVLTITYVYPT EDEEKVRKAVGNLFDLEMFEEREEEMGDLRRLEFVCEGPQAR
LSLGRIYELLREQEILDAARRVLREGVTAEGSILFHLNKQAAFAGSVSFAEGGESPLG
PIVVEVFPERPEDVEKVIDWLAPETIDGKPIYEVKKPRLREEELE

<SEQ ID No.:0400;PRT;Methanopyrus kandleri>

40 MLICVVGMPGAGKGEFVKVAREEGIPVVVMGDAVRREAERRGMDVGEMAKRLRE
ERGMDAVARLVEEDVERELRRAGVVIDGIRNPEELEYFRDRFGERSVIVVAIHASP
QTRFERLRIRGREDDPDTKREFEERDERELGFGIGDVISRADVMIVNERVSLPEFRE
KCRMVIRAILRGDPDDLPGGFDHLRVPD

<SEQ ID No.:0401;PRT;Methanopyrus kandleri>

45 LGEPAAVPRAAELRLVKCPPRHFP EMVKLSRALFRLLVEEHGTDGALEKLADPRW
FQSLACLLGYERN TSGSTTVTAALREALDPEEHGIAVAGGKGRLAETPKRVRELA
DRMNLDPRLVTASRLTARSDSVCLQDGHDLYHHVIVFDENGRWVVIQQGMDVDR
KTARRYHWLDSEVSEFVEGHPVVADETRKVL SLQGDRADKCREAVLDLVGDGPDR
VLREWRAVRNSISGPLDEYLGREGGVEVPD GWVPRRLDRDALRRLYE VNPTDFKE
50 FLTVRGVGPSLVRALALIAEVVYGE GPD RRDPAEYTA AFGCKSGDPYPVHRELMRL
AAELLERIRSPRLRRFLGRVTES

<SEQ ID No.:0402;PRT;Methanopyrus kandleri>

MELLTLAPDVRPEETERMARKIQDKLKLPAEPDPLKPVRRRLRIEGVEDPDGIVSKLR
EEFPEVSRVVIVKRRGRSHDLDRIAAQAAKLARGEILPHHTFAVDARRLDKDLPYTS
5 RDIAIKVGEAVRRVTGASVDLDSPDRYVDVHVSRRHGLGITPATLREPHRSWLPS
GAFKHVHVCCERPETEYEIADLRITAALGLGSLILVEPNRDAVRGAEKEKVGASSLIDL
RIEEDLKEALAEFDVVVGLHPTAPNAESELLRAVEGANQICLLTGSETKGLSREAKE
ADVLVHLGPTTAEPMRTANAVAYAVGVLAARTVSLGSATAPTLHR

<SEQ ID No.:0403;PRT;Methanopyrus kandleri>

10 VSGVLVLERIFEEAEGEGRGALIGYLTGHPGLEETVSLARALRDGGVDILELGVFPFS
EPIADGPTIQKAVDEALRAGTTPWDCLEVAEEVSEFVPVLLCYNTLHANGFERYL
SAAAEAGVSGIIVADMPVEESDEVHVSARDLEIDVIYLVAPSTTDERLKKIGERASGF
VYVISRYGVTGARRDLSEDTELVVRWVRDHVDVPVAVGFGISERWHVEEVIAAGAD
GAIVGSAFIKEIHRSEDIAEAEERVRELAKELVEGARDGYRRRSSE

15 <SEQ ID No.:0404;PRT;Methanopyrus kandleri>

LTLIAQIAASFGALLGAWLFTNTVEWISYRFKLPSGFTGSFIAAVATALPETLVPIVAII
AGYREGVAVGAILGAPLMLSTVAMGIGGLSVLAAYLMGRRRRPVIKTSHFSLDARHF
LVAYSLVLAVSLTDFKPAHFAVAVALFLLYLVYVRLLRTGDVVEQPSIELEMAHPVL
20 AGLLAAVFLVGSVALLVAGAHGFADAVERLAERLGADPFTVSCLLAPIATELPEKLNS
VIWYLKGRDDALGNVTGAMVFQATFPVAVGLLFTSWRLGSRELATVTVPLAAMVL
LYLYSRRNGLDWKVMASAVAVLYPVFVLT

<SEQ ID No.:0405;PRT;Methanopyrus kandleri>

25 VSGTIKLSRCGLRAPTCEPVRRSYFERLRRYRDYQVRELYESGVRIKVLARVFDLSE
GEIKEILLSPPRCARCGKPLRTNVPLCSECERVLEGDDRSRTDGR

<SEQ ID No.:0406;PRT;Methanopyrus kandleri>

30 MIGAVLMGGKGRRLGGDKPWLTVNGRPIVEWATEMLRRIGCEEVYAVSPRRDGR
WDGPWLRDSKSGSPMAGVRAVREFPNEIVCVTSCDVVFDPRIFREVAEPPCHTR
GTLFPFLVRAEDAPEHRTVREFLKNIGSTELEVPAATDLDELEDLPRYRALLSRITG

<SEQ ID No.:0407;PRT;Methanopyrus kandleri>

35 VVSDVIVVGIDIVRSEPPEYAVAILEDGEEVLKKRLSKRELFDLILSLKPDVVAVDVY
ELLDGASEFLELVKSHPELKLQVTGKPGDQQRSLQRLAREHGLPTDPRNPEEEAL
TCARLAELGVGVEAFVLEDETRVRIGRLRRPGGGYSQSRYARNLHAARKRATREL
QRLLEAEGMEYDLRVRKAEGGYASAEFTVYERYDRVKPVVNKVDAREIKIDVEPVL
RDRITFRDTSRRELLTIGVDPGTTTALAVLNADGEVHLESSRELSFSELTERRIESL
40 GRPAVVATDVTPVPQAVRRLARSLGARLYVPDRRLSVDEKRELKVGHLARRDQNI
PRDTHQRDALAAAVKAYHAIVKPALRKVERKASEEIKRRDVLRAASYVIKGLPVVDA
LRIVEEERQVERERREEREKIHRYRERIASLKKELRAYEKKVKKYEHEIEHLERLVER
LKRENEELKEKLDNRMRDRMEELVEEKIGRKLEAKEREIERLRRELIREKSRRERLER
ELRRAERLNAILRSGKGIPVVEVEKASHEALAGLETPPVFVLYVEDPSGMSESNVRE
45 LSDLSPEAVIVPEDASIPHALEEFRRDLPLLLREGEDVTVKRAGTLALVESDELRA
VRRTRKRWEEREREREKERILRCIEEYQRRRRRGKFIR

<SEQ ID No.:0408;PRT;Methanopyrus kandleri>

50 VNPAPSELRFAGAYAIDCVITAVMSLLICLALARPVTPVRFLSTWSLISWIYWTMFEGT
YGESPGKRVFGLKVNEEGEAVSLPEAAIRNVSKALPVVCYVDGALILLTESRQRAF
DLLAGTFVVTSG

<SEQ ID No.:0409;PRT;Methanopyrus kandleri>

LI AVLVD DGFE ELGAVVSVLSRGGLDWDLVGVEERAEGMGGMEVGVDSTWWDV
EGDDYEGVWVLGGSAPTTLIGYRHCLDLVRSVESDGGMVVGLSSGALVLA EAGVLR
GRKATTYPGF EAELKVNGAEPV PKGVVRDGNVVT SRGPAFAIDACLEVREL CGD
HMANSVARQLILK

5

<SEQ ID No.:0410;PRT;Methanopyrus kandleri>
LLV VSLGCPKIPPKISSAIYACYRYDDRALVLSTEAGCKLLEYADPEKEYVDETRTYE
KYLEDPDAAGILLAFVTNDTELQIAVTLKEVSEPDDARAVCTEEFEDRLED CGFLTAP
VTGRRWKHDPKRWWKAVEDVLGASR

10

<SEQ ID No.:0411;PRT;Methanopyrus kandleri>
MTFCLEEREYEILMARRPFDDCARYIESKFGNIVKLQPGEEILPGLRAIGYGKIPVAY
GDEWIVLPITKPCHGSFVVKIEVSAEELEWFLKKHVSGR

15

<SEQ ID No.:0412;PRT;Methanopyrus kandleri>
MGKRIRPQRLGRGGPTYRAPSHRYRGRIEHRPYDEQEKKGKVVGKVVELLHDPAR
NAPVARVRFEDGEERLILVPEGTKVGDIECGVSAEIKPGNTLPLAEIPEGVPIFNIEG
QPGDGGKFARAPGCYATIIAHDVGRTYVQLPSGKVRTFDPRCRATIGVMSGGGR
EKPFVKAGKKYYHMR SKGGKWP KVRGVAMNAVDHPFGGGNHQSPGKPTTIARGD
PPGRKVGHIAARKTGRGGRR

20

<SEQ ID No.:0413;PRT;Methanopyrus kandleri>
VAKRYGPKIEDPHDVLLYPVATEKAMRLMEAENKLT FIVRRDANKPLIKKAVEELFDV
EVEKVNTLITPTGEKKAYVKLKPEYRAEDVAVDLGIL

25

<SEQ ID No.:0414;PRT;Methanopyrus kandleri>
VEAPVFNLEGE EVDTVELPSFFEEPVRKDLIRRAVLAAQANRRQPYGTDPRAGFRT
SAESWGAGHGVAMVPRVKGRRHPAAGRAARVAQAVGGQKAHAPTPEKDW TQRV
NRKERRAALRSALAA TAKPEFVKERGHVIDDVPHLPVVVVDELKSLNKAREVREFFK
SVGLWADVERAKSNRRIRAGKGKRRGRRYVKPKSVLIVVDEDEGIKLGARNHPGV
DVVEAMHLGVEHLAPGAHPGRLTVFTPGALEVLEERLGE

30

<SEQ ID No.:0415;PRT;Methanopyrus kandleri>
MGRGGRRNPGRPRRGSLAFSPRKRASRPVPRIRSWPDEERV RVQGFAGYKAGM
THAIMIDDWPNSPTEGEEISVPVTILDAPPMYVAAIRAYAPTPDGYRCVTEAWAEIPE
ELEMDRVFTVPKDGEAGDLKDIEELVDEGIVEEIRVIVATQPKKAGVPKKKPDVMEY
RIGGKDVRE RF EYAVEILSEEIRAKDVDFEGEIVDVSAITKGKGFQGVVKRWGV TIQ
DRKTQRKQKGRHIGSIGPITPSRVRWTVPMAGQVGYHQRTEHNKRILKIGEDGEEV
TPRGGFVN YGVVRGDYIMIHGTVP GPKKRLIRVRPAVRPPKNAPEGAPEILYISRTS
QQGVRPKASEDEIVEQLGGPASA

40

<SEQ ID No.:0416;PRT;Methanopyrus kandleri>
VDVRS AERLLEDLKEFAERVNKAFSRINPQIMERRTPRGWLRE MVREYFENLGA EV
LREACEIAKEDIRSYRELD ELLQEIERSTDREEDVLYVRRALLRYMFCRTYTLQRLLV
RLYW SLSAGTADVAELVGMLRRMDLFAEEAQLIYPVTPDVEDLREAVKDAIQVIGEE
VGAGTEEEEDDRLEPEPKLEV CVVRGKLPAFVDPDTGAEVPPSKEGDLLMVGETAA
RILSERGRRWGGPF AEHVRRWRG

45

<SEQ ID No.:0417;PRT;Methanopyrus kandleri>
LAKIPKKIRTYCPYCRKHTIHEVERAKKNPARKMSWGQRQFERVLKGYGGFPRPKP
SGEKPTKKVDLRYRCTECGKAHTRKGWRAGTLEITEE

50

<SEQ ID No.:0418;PRT;Methanopyrus kandleri>
LDEKRLKRFTESDLVPQPRSRFLRVECVDCGNEQIIFGNASTEVKCHICGRTLAKP
TGGKAKILTKIKEVLE

5 <SEQ ID No.:0419;PRT;Methanopyrus kandleri>
MPRKLRDLPEEGEIVMATVERVEDHGAFVTLDEYPGVDGYIHISEVASGWVKNIRD
YVKEGQKVAKVIRVNPKRKYANLSLRKVTDHQRKEKLKEWKREQRAEKLLEMAA
EELGKDLDEAYEEAGYKLIEEYGSLYDALERAAAEEGPEPLLKAGVPEEWAELAE
10 AIENIEPGRVKIEAYVDLTCPAPNGVEIIREALEKIEEFQQGDVKMEVQYVGAPRYRIT
VDAPDYRTAEKMVRKAAQAIDHVEEHGGEGEFHREIEEG

<SEQ ID No.:0420;PRT;Methanopyrus kandleri>
VPKRLRRCKEAGEYTLQRDKCPHCGGDLEVPHPHRFSPEDPYGKYRRKLKKRVW
AEKFGPPSGEGD

15 <SEQ ID No.:0421;PRT;Methanopyrus kandleri>
LDLLKLARGNTVIKFDPEPEVEEPVLVEGLPGIGHVGKLAAEAMIEDLGAEKFAELYS
PYFPPHVSVNEDGIVEVMRNEFYVYESEGDEPDIIFLIGEAAQAGELGQHEVTIRILQ
TVKEFGTEMIFTLGGLGTGTVPTEPKVVGAATHKELIDLLKEHGIEVRSGDKGGNIV
20 GASGLLLGFGKMMGMKGVCMLMGVTPGHVIDPRAAMAVVEKLSTILGVEVEADSLKK
RAERFEREFVAQLEEMPSSALEEAQQEAEEGKPEEDLRYIG

<SEQ ID No.:0422;PRT;Methanopyrus kandleri>
LVLRLATLPLHALIFGLTLFTAFIRPPLAPIIYEKRERYDPWNSIVLAALMIYGLAPLVGL
25 ENSCLAFLVAKGVDGAGGLAQFIPGSINPVVSLKGFRIREVEEGISPIGTFFEFALAAL
GLWLITGSTQGALVMGIAVTAADILSNVTGVEDHHKGDDLLMMLSAAWVIQTFGV
SGLMRLGLMPGW

<SEQ ID No.:0423;PRT;Methanopyrus kandleri>
30 VDLRYLTSAISVSLFVYSGIDTEPLQYVTAQWVESVLHLMGLTVPKAGYTFQVGTVS
AMIVKGCVVWPAISLFLVGLIVATPGPSVLRKIAALAASVALLTAGNVRLASMFYMMME
VWGVGFRLAHDVIGQLVGLAIVILAAWVAFYIVPETEDKLREIIPWPGE

<SEQ ID No.:0424;PRT;Methanopyrus kandleri>
35 VGEQYSDSLHLHSQYSGGTSPRMVIREIARGAAKKGLDLVGTGDILHPKWRRHRV
RELVEDEYGLLKEPKTGVLFVPTVEVEDERRVHHLIILPSLDHAEELHGELSRYSDDI
DAEGRPHLRMTGAELADLLKDHDCLFGPAHAFAVPWTSVFKEYDSLRECYGSAMDR
VDFVELGLSADSDYADRISELHEYFTLTCSDAHSPYPHRLGREFVRFELEEPSYDVL
KAAIRRKPGGRVVLNVGLIPELGKYNRTACARCKRQFELEEAERLNWRCPECGGTI
40 KKGVRDRVLELADLEKPKHPNHRPPYLRIIPLAEIIAKALGLSTITAKKVRVWNSLVR
RFGSEIDVLIETPIEEIAEVDERVAELLKSFREGTVNIRPGGGGEYGKIITEEESEREE
PRSRKPVQRTLDELIGRG

<SEQ ID No.:0425;PRT;Methanopyrus kandleri>
45 VTRLFFRRRSVESFAERIEVKVGVEEELFLIDRDGSLTRAADDVIVKAAELLESNSNL
LEDCWRTVLGLDPEPNPAQIEYLTQPLPPDEVIEACEIGRELKAAEELGLQVMLES
MHPFESDPLPINGTHINVMVKLKDQPYMTPKQILVVYNWLWHNLPPIIAATANTPYCC
GGKNLAASCRLKSRVLKPNYYAAIKRLEKRPYLTQTQYYGRLRYRLRLRKDTEFEE
RVVAHPDGRRLVDITPRGPASNVTDENDSPTRNRVEVRVIDNQKSMKYLHDVVM
50 LIVGLSLEALYIYEVEGKLPPNDPNHFDNRREAIEKGINATFVINGREIDAEDALLKIIS
RVDKFLEHLGLRFVSPLKNGKVELQERPKNVEYVHKDVIKYIGNYAEVILGSNKTVE

IKGKRYTIPKGTKVIGKLVPMAASYKYRVDNKGFKDIIKGVVTLGIKRNNGVEIPLDESD
RIVNVMSELEYLMRSMRGLL

<SEQ ID No.:0426;PRT;Methanopyrus kandleri>

MIIDVHNHNLGEDIDSTVQTPQMLLARMEAAGVDIAVVPFNDVDPGVCFSKANDRIA
KACEEYDEFVGFRCRVDPNYEERAVEEVERCIEELGLKGVKLHPRSQSFPDDPEAV
KVVEKAADLGVPVILHTARGEPPSDPVRVGKLAEEVPDVQLIMAHMGKELGYDAAIE
VAENYENVYLEVSLVKDPKVIKTAERVGDDRIIFGSDSPYGSPSVQLEIVKEADVNH
DKILEENAA NILGLR

<SEQ ID No.:0427;PRT;Methanopyrus kandleri>

VLITAPHAQGPADVFTGEIAWKVAQATGAYALVATVSRRAKLEDGNPADYNREW
ARNTPFRRRIDELIKRYGVRFIDVHGMESDPVRPDVDLGTLLGGRSAKGLVSKIVK
RLEEAGFDVGFEQEFQGGDILEYHCDGERVQGVQLELSEELRELGEYRAIQAVLVV
VNTVLEEV

<SEQ ID No.:0428;PRT;Methanopyrus kandleri>

MVAVVLVGHGSRLPYSRQVVEKIAEYVEEMGDFETVEVGFMECEPTVQEAVKKA
AESGVDKIVVVPVFLAHGVHTKRDIPKMLGLEPEWDDDEDDHDDHHHHHRDYTPV
DVDAEIVYAEPLGADPRIAEIVIDRIKEALGEE

<SEQ ID No.:0429;PRT;Methanopyrus kandleri>

LIATLTGRTIEDMVELAIEAVEQGADALEVRLDYLENLDMSTALRAVRECTRYERVV
ATLRREEEGGLYKGDDEDRRLEILERSSEADYVDLELDVAEEEEIISPSCETIVSYHNF
ENTPPKEELIGIRDRCAELGDVAKVVTMARGHEDALRILEVVRTAEAPTIGFAMGEE
AKYTRVVSVLIGGFATYAAVRKKAAPGQLTVEETRKLLELLG

<SEQ ID No.:0430;PRT;Methanopyrus kandleri>

VEREITPIVLREGYEFINDCSESDVIVVGAGPAGLTCAVELAKSDVDVTIVERKLYVG
GGMTGGGMLFPAGVIMEETAEVLEEVGVELRPAAEAGLLAFNPVEAAIKLANAALEA
GARILVGIEVEDVIERRGRVCGVVVNWTA VKAANMHVDPLALEAEYTVDATGHEAA
VCKLAGIEVKGEGPMWAERGEELVVKHTQEVKPGFLVAGMAASAVKGAYRMGPFI
GGMLES GKKAEEILERLTE

<SEQ ID No.:0431;PRT;Methanopyrus kandleri>

MTIAEFVAVGVLTALIIVAIALIVRSREVPEGEGLSMLRDKISLTTRSDVITKKVDELIEC
RVEELIDSWGLATTEDVEKVEKRVDALDRKLNELEQRFNEFRNDIRRKIERLESRLR
ELSSE

<SEQ ID No.:0432;PRT;Methanopyrus kandleri>

MVSVLIGSTA AVIIVLIALKTYSKKLRIRELELKVVEREKVELVRADLERRKLLDLLFY
PEDTRLMKRVGEIRSLLTRLAEKYMDVETRLTVVELETELKRLEKILKDLERVEGDVR
GGENE

<SEQ ID No.:0433;PRT;Methanopyrus kandleri>

VRILITNDDGIASPLRAAVRACRSVGEVTVVAPATQQSGVGRSISLLEPVRVEEIEV
EGVDALAISGTPADAVLIGAFSIMDEPPDLVSGINLGENVSADVTTSGTVGAALAEAY
GNGIPAIAISQEVDRARVDNNAKNVDFTLAIRVLKALLEAIRGANWEGVLNVNP
DPDRWNGEIKVVPLAFTMYRPRIEKRYDPRGRYYWIDGEIIQDPPEGTDLYELQR
GSIVITPLTTDVTGDLDA AENVIKELRRALRG

<SEQ ID No.:0434;PRT;Methanopyrus kandleri>

- 5 MQFWKVHGARND FVLVDETEEEVVPESDKPDFARWACDRRSGVGADGVVFIRSD
PPSVEMRIFNRDGSEAEFCGNAARCVVYVTEVRGENVKILRTLSGAHRVEVQGG
WIAVEVPEAEIKKVVELGYEVDAGVPHFVRLTERDPIHDFGGLTDEAKTIFSEYEPKG
GVNVTYAAPSVDELVRVTFERGVGWTPACGSGVVAASLVYSEIFGPFEVSVRTA
GGCLRVSLSDGPLLIGRAEIVYKGELRGDWRENTDHQRRRHSLSRSPSGRPRLQE
CR
- 10 <SEQ ID No.:0435;PRT;Methanopyrus kandleri>
VRPLSELDP EELIRYISESPKRTIAKFYVKTDDPEGLAERLEERLEDAKVFTGVDHVIV
IGEHD DVVEVLESEDSVEYYHKELDHRNRAVPLADYSEFEDVRIEPGAIREKVKL GK
GVVMMGAVINIGAKIGDGT MVD MNAVVGSR AEV GKNVHIGAGAVIAGVLEPPSAK
PVVIEDD VVIGANAVILEGVRVVGKAVVAAGAVVTEDVPPSKVVAGVPARVVKDVD
KKTEAKTQIVDALRCL
- 15 <SEQ ID No.:0436;PRT;Methanopyrus kandleri>
LRRVLINNKDSFVYNLYHLFASYDL DLKVVS NKVPLSR LERLRPDGLV VSPGPGHP
ERDAGVSVPAIRRFAGEIPILGVCLGHQCIGVAYGAQIRRAKRIVHGKTSPIEHDGSG
ILSGLESPFQGMRYHSLVIEESSLPEELLPCAWSGDDGELMAVRHADYDVYGVQFH
PESFMTEGGDRIARNFLELLG
- 20 <SEQ ID No.:0437;PRT;Methanopyrus kandleri>
VRLTVRELDIDRSPDEVYAALRTLSSHTFLFESAEIGASGRYSFVGFSPALRIECVDG
RVRVDVGDPEYADLVVEGRKETDEDHFQLMRRVFSRIPKVEGSGFVGGLVGYISY
DVVEDWLDVKSTTVADPEWPSFELCLYDSVVRFDDHYEDRVELISVHPDDYEVWT
25 AEAIEECVREVSGQTAPKVHRTGELKRDLEKEEFEGIVERAKEYIISGDIFQVVL SRR
VEVRAVADPLEVYRRLRDINPSPYMYCLEFGERRIIGSSPETLVRLEGDRIITKPIAGT
RPRGSTPEEDEELAREMLEDEKELAEHAMLVDLARNDVGKVS RPGTVEVTRLMEIE
KYSHVQHIVSEVVGERKEGVTPWDVLRATFPAGTVSGAPKVRAMEIIDELEVYKRG
PYAGGVGYVSWTGDMDFAISIRTIFSTGRRWFTQAGAGIVYDSVPENEFETENK
30 MKAMVGAILEETSSDK
- <SEQ ID No.:0438;PRT;Methanopyrus kandleri>
LPFPMERFMLSITLWNTMTILITTFGG LIALTL DRLVTRYAPDVLRRSMNNPPYAPILV
KLARKLGFDVRRYKEADVILTLKGLPLIPAINGF AAGAFGMWVLQNF GPVFL LGAAL
35 LPHGVIEFPTLIAGAMGVHLADYLIYRVLHERWPHGNLEVPSWVIRNTAACIAGLT
VAAYLEVHITPIVAGCVMKCA
- <SEQ ID No.:0439;PRT;Methanopyrus kandleri>
MPFDRDKLEELRSLAQ RDFDRAWKEGAKLVREPGLRDRYPRLKVETGEPHPLFETI
40 QQLREAYLRAGFREVVNPV IPEEEVYKQFGPEAAAVLDRCFYLAGLPRPDVGLGA
DKVEKLAEVLGREPSEDEVERLRETLHAYKKGEIDGDELTHEIAEALD TDDGTAVRIL
DEVFPELKR LKPEPLEPPLTLRSHMTAGWFITLSEILKREDPPLKLF SIDRCFRREQR
EDESHLMTYHSASCVVVSDDVTVD TGKAVAEAILRQFGFEDFEFVPDEKMSKYYVP
GTQTEVYAYHPDLED SIEDEELGPGWVEIATFGLYSPVALAEYGIDYPVMNLGIGVE
45 RLCMV LHGIDDVRS LAYVEYEPWEP S DLELARMIDYERKPATSFGERLVREVVRGL
HEHADEEGPVEVELFRGEFGDREV VHAVEEEKGEPLAGPAAFNRVYVLDGNLYA
VPPEGDFGREIREEGVYSGVSFE EGLAARLAYEVEELLATGGGETTVSVRKVSRPS
QVNL SLPRKLLRYVT KKGGEIEIKGPVFVTLRAEVR
- 50 <SEQ ID No.:0440;PRT;Methanopyrus kandleri>
VRPLPLIVACAVALASPALAWERTEVSDTYVLN YEGDAPNHLMLD VDIADENG NVF
VGWLLDGLESKSEPRVWEGLM DRVTVILNAIYDDGKLRLEM RKTFTVHF DYDGND

GVHVVYVKGDDAPIIRTEDGRTVLWERCQRRRIRSSDNGRRRCERSEMEGRTWR
R

<SEQ ID No.:0441;PRT;Methanopyrus kandleri>

5 VHWIAEGWARIRVKVAASNSGKVLRLDISWHYDKEERREERQERGVPVGAVASL
TGVLAWMLRSSRSRY

<SEQ ID No.:0442;PRT;Methanopyrus kandleri>

10 VDAAILTVSVLSLCVDLNKQADRLETHLPFRLSSPYPTPFYVVLARPESIEVHPPMD
PEGELRIEVLPSGSKVLFDSREYGARTVVEFRGPYLMVTRLPVVGLPRDLPRAAVFF
SDGRRNYALISYRDVATGRAYVALCEIALNLHELVRVPVPISLDLGERLSEFTLYDNG
TFSAKFEAGGGELVVRGSLRPPGLSVEWDGEGELIGEKRPIVPGTSWALLNKCPVI
VFGQGTNDLLWPDREYLVWRTLTSYRSELEDVVEEIVKRSKRSIDLGPALLCAYSTL
15 AGLTVDTLISQVRPRLWSGPWAUWLGAVVETVVGIPVLEWGVLLPIVTRTGELIGTV
APTVD RSGVVTGIYWLTVEWYEAUWLRVIMRTCGLSWWETGMLWGALDALFNSL
KERSLNPHDLMRRLTFHVAASLSPVLEVALYAENAEDTGGDVITYYSSILAAMVRWP
EQSLPLQRLL

<SEQ ID No.:0443;PRT;Methanopyrus kandleri>

20 VEDLHHRGTSVSEIENLRETIENIREELDALARDEAQVILRDLHKLSSSEAVYEVHR
GNLEEARDKLDEAAELVSELHDLGDFPELLRTGFAENHLQEYAEAEILYSIVKDRR
APSPEEINVSPRAYLLGLLDAGELRRIVDALREGDLDRAEFLNVMEIYSLTMTF
DYPRAWPNLKRKQDVARSLLETRSEVTIAGKTEELKKTLE

<SEQ ID No.:0444;PRT;Methanopyrus kandleri>

25 LSSLSRQELTARVFVEWEETRRSLRECVKKVLLNEGVRDHRVWGTIHAYCFELMKR
LRTVDAFLEATIRNAKLFDLPWVRNALRVGTFEMKFNDVKPAIATNEAVKIVVECV
GEGPARFVNAVLYDVERLELSDVLNRAKDTVERLAIEYSHPEWVFKHLMDLLGENE
LTKLMDANNREPERYLVRVHAHMVDPDKAILALEDGVAVEEDPDLPFMLRVVDHVD
30 PPVRTEPYRRGWVAYQDKASAAAAYALRPEPGDRVLDACAAPGGKSAYLYALTEG
EIELTCVDVNPRRLREMRRNFRRWGIEARLRADSSRLYRETDETFDLALVDPPCS
SSGAYVRAPEAKWTVKWRHVVKRYARGQLSILRGVAPLVERTLVYSTCSVTVVEDE
SVVRRFLREFDEFEEVEEPFGFGSPGFDWMNERYPWADRVRRFWPHRHRTEGFF
VARLVRS

<SEQ ID No.:0445;PRT;Methanopyrus kandleri>

35 LYLAEVAGIEELSAVAVLGIGGGGDVVGACHTYRWIREGIEPERLVLGGLTWERAVV
DPEPGPRSRDEIVGDVEWIIHERIGILRGRARPRRGQEFASRVRRVLRMRGHRDV
EIVLVDVSGGVKGTVDGLKALIEHFELDVVFGIDVGGDALARGDEPGVESPLADSIM
40 TCSLSKLEETVLGVFGWGSDELTREELRRRFSEIAAEGGYLGAIGLTGRDVKFLKK
LAEVVETEASLIPLRAAVEGELGPLEIRGGYRTVELGPASVCTFYFDPEVVARGSILC
ELVDGTESVEEAHERIRKELGIKTELDWERERAER

<SEQ ID No.:0446;PRT;Methanopyrus kandleri>

45 VLLNEVKVRKIVELALTEDVGRADLTSSIVEGERAEAEIVAKEEGVVSGLTPARLTFE
LLDCEVDVLVEDGERIQPGDIVLKAYGEATALLAERVALNFLMRLSGIATATRKVVE
RVREVNPDVIVAATRKVHPITGFLEKKAVSDGGGDLHRFGLDDAVLIKDNHLALVGS
VRDAVRRARERVGFTKVIGVEVESIEDAVEAAKAGADHVLLDNMKPAEIRRAVNEV
50 RKVREDVILEASGGITPENAPEYAETGVDVISLGWLTHSAPALDLSMRVRRMT

<SEQ ID No.:0447;PRT;Methanopyrus kandleri>

MSTDYLPIGSHEVIRALHDLEPDVVAYLPGFPLNEVVRALEESDHPFEVVPVASEFD
AVGIVIGLAQADGYGVAVLKDKGAYVAAQLLAEEGDWPGLLIIGLDADGRGSYTCVS
ELPDVLRDLKLRVEIPETQDDIYETILDAAESSRDEHRLACVVLTEDELLSSHPPGKP
EVEPTGEADWDELLRAIDFYDTVAVVVGKGVLDISRDLPFTSSLNDDRDALDRLV
5 EILESGLDVRLYCTKHASKFLPGIPPTGVNTGNVVEEELLVLVGASYDTFAVDFRSD
FVSVNPDPDAYAHRVADARFVMTLSDFVRELEYRSRK

<SEQ ID No.:0448;PRT;Methanopyrus kandleri>
LRPEEALLALRKVLKEEDRVIVDLGDHTIAAAKVGLDPDGGTGALGGSMSVALGHCL
10 GTDGGRVYCVGDGGFFMHLHTLATVAQNRDRFENLTVVVTDAAWGMTGGQEN
PAVHTSPADIARSMGFDPAEIAESVEEALEVLKRCRKEGPSLVEMRCRPITFL

<SEQ ID No.:0449;PRT;Methanopyrus kandleri>
LEERIRCEICGRVINGRPKVVKVEGSELVCEECAKFGREVVKPRPRRETGRVQRE
15 RRPRRRPTGARRRPRGDFPFSEGLEVPDYDERVREARERRGWSQEDLAKKIGE
KVSIRRIESGKMEPDVELARKLERVLEIELLERVSEEDTGSVGIGSGELTLGDVVEI
RKK

<SEQ ID No.:0450;PRT;Methanopyrus kandleri>
20 MSLVKSANDVIVVGEDIDEFNKGVLSVCKETGKVILFGKDYLNKFSIDEKLETSE
ESLPIKRCDAIVDEDETEVDGKLLLDVPADEYTINEVLSLVKEQFKEVCDYERGVEAD
VLLVIDSDRGRRLRIYANGDEDEVEDKARELCMKVAERVVEERRSAHIDIRTYGFALV
SVALAIVVTLILRTSPV

<SEQ ID No.:0451;PRT;Methanopyrus kandleri>
LHVVAVDLGTVEISAAGRLRSGNLMVKGYSERIYLDPTIMERGNVRYVKGVSRIK
KTVEEALRDAGVSPSDVEGIGLSMTGDRFTMVEAEASVSPEGKLRIDIGYTLAHL
EFSPENWPISVDIVDLKVDGAEDPRELGADHPDGLIGSQVTHLQFRAIVSNTSLGLI
NNLERIARLLNMKLITISVEPLAVAKAIRDYKIENCLLIDSGGGTTDISVVRNTLVEVCH
30 SIKVGGGRDFTLAIANDLGLTYEEAENIKKKINSPMADSELSRYDLTRREVLEAIEEVAE
YVRDAVRSVAKSIIRSLDMNVPERVELYGGGVLLDQAETAVREAILDAYRDYLGIVP
RVEMLEASKIPHIGKQLAGPMRVVAVSVLRDTALCQQCSGRDVKVVIDEFRAPEGR
YYLEVGGRIEDSVKIPRRTGLKEAIIAISAIKEIILMQPAPVTAELRGRAYAGTVTIKFEGV
DSTDDVDGVKVNVSSEVEDTVDLTPKEYKIVQVKEMGPILIPVDELQVEEGGVSET
35 AGNVTGLKEGLDDSGGNEPR

<SEQ ID No.:0452;PRT;Methanopyrus kandleri>
LNLVAEAVRRFKSVDLIRSQILGLKGLLPRKDRAVEVSTGARLVEEAIEVRNAVRSG
40 NREALIEELGDLLEVEAFLTAHDIDLEEIVERQRTKQRELQMEG

<SEQ ID No.:0453;PRT;Methanopyrus kandleri>
MIGKRKVERLLDEFPNEVEYHRSDDHVVTCPTELYLVPTPIEIVVEILRKLELTPKNRV
VDLGCGDGRFVISAAYLYGCEGMGVDVREDVLELAKSETLRVDDKTIFIHSDVR
DIDLRELNPDVVFVYLMPSLLEEISEELVSCGATVVSYTFEVPGLGVPEVLRLLDDLRR
45 AYYVRGVSH

<SEQ ID No.:0454;PRT;Methanopyrus kandleri>
LFVVIRSDSYEKILTSLSDIERYAGIKILGKPRIMDPEVADTIVRELLGEVRRRYPVAAV
ARVEGEPAEVIRKISEIHPPAHLVITPRHGDVYRGIARRFGKLEELRGYHSPKRRIED
50 DREKEGRETAR

<SEQ ID No.:0455;PRT;Methanopyrus kandleri>

VNIVGVDSGRHAEEDGHYNRITACVSAEVDGFNVFTVRDVNVFVVCTREPPNLR
LTEEVSRLNGLDKDDEYMVVAEPGEFFGEPEWRVSALLGAPFKYAETVAEREV
EMAHKLAGVYRGVVKMGLKVAQSPSGGFG

- 5 <SEQ ID No.:0456;PRT;Methanopyrus kandleri>
LPSRPRAVLVERLEWRQESRIDELKELAESAGYDVVGSFRQVRHEDPRYHIGEGKV
KELAEFVRENDVDKVFENEIKPVQAFNLAGELGVEVIDRFQLILEIFAQRARTREAKL
QVKLAQLKYELPRAREMVNLAKKEERPGFRGLGKYEADKYEEMIRRKIAKIERELRR
IEKDRELKRKHRHRLGFELVTLAGYTCAGKSTLMRALTDENVYVDSKMFSTLDTKTR
10 AVDLDGHRVLLTDTVGFVDNLPHWLVESFKSTLEETAQADLVLLVVDVSDDELPEIKR
KLRVCHRTLEEIGAEGPIVTALNKADLIGWEEAERRLRELEGYVSHPVVSAKTGEG
LDDLKAEMRTVLSRYWKNVRIELPMRNETMRVVSKLHELGNVLDERWSNDGVEVF
LEVSEKALGTVRGTVKGFGKVEVLD
- 15 <SEQ ID No.:0457;PRT;Methanopyrus kandleri>
VARDEIAVLTSRLERVARSRPRGDLWEFLKRAYEKGVKIDAGHLIILSVLEENRL
LDQLSKTVGEKRAKQILKEAGIYTKTGNVYSGELLKEYINRESRVAVHNRVKDLRKM
GFKIDGKPGPDGGYSLIQVPEWYRKSSRED
- 20 <SEQ ID No.:0458;PRT;Methanopyrus kandleri>
MRAEMWATKEYPRVKPEDSLEQAVRELTRYSEYTAVVNGSDRLVGLVTSNDIAR
GLTAGAETVEEVCRSPESISPSDPITKAVEILTDSDLTVPLEEDMRVVGWVTLRTVV
ELMSNLYDTPARDLLEKIHENVPGISWDEFIEAATMVFNRELNRDLTPEEFERKISDR
TFGYVLWLMGGLENLFIYLFRLGEAVVARKVAKRRREL RGM
- 25 <SEQ ID No.:0459;PRT;Methanopyrus kandleri>
MKTLEISIDKVVEMVLDRVEDADEDTVLEVLSETPAVRREFVTIDPERCVGCKTCYE
ECPVDALTEPDSTNPPEVDHDACVRCRLCAKSCPVDIAKVVSGEARVTKDSIEVKLE
EVDVIRRKFVLKAILRKDRCIACRLCEQICPVEAPNIDKLRIDEDKCIGCKACEHACP
30 VDAIVIERTLTPPEFEREIELDQDMCIGCEVCVEVCPVDAVEMEGDVANISYDRCIRC
GECARNCPGTAIKIKEVREEV
- <SEQ ID No.:0460;PRT;Methanopyrus kandleri>
VDVIVEVREVVVIELCRACGLCEKECPTGAIEVEDSAKIDEKDCVRCGLCVEVCPF
35 DAILLGRATCELPKGSYRIEVLTKRPEVSVRISESKCVGCQACSSSCPVEALFGAKG
SPPKLDVDRCVGCLECVRICPSRAIEPVGGFRG
- <SEQ ID No.:0461;PRT;Methanopyrus kandleri>
VVVDLHFSFEDRLRNVTINIVEVERPDECAGCGLCAEVCPTGAIEVDERVLDEDR
40 VACSFVCVQACPRDVFRFYEVSFTELKPKRRPVVPKADIEVRFIVDLRTCDRCEN
RPCIEVCPTGVMREIIIEHRIDLDACHGCLCECVKVCYPYGSVTVELEVPLKRRSNPR
LNRELCVECNRCHEVCPTGAADNVDPDGPDERCLGCYNVAYCPTALKRPDH
RPRPKCTDEVFYIQPDMCIGCRICYDVCPDAIRIEEITRMPVIMPDLCVRCGLCADA
CPTSAVDRVPTEEAEREVLRSRISDAFLGILTREMLEAAEEFGSTTRTERDVEEKLS
45 ELLERKMSEEMIRRVIEFEVKNVIEELMAEVVSGRDSRGP
- <SEQ ID No.:0462;PRT;Methanopyrus kandleri>
LLQDFLNHILSREGSKRLDAHTSREIMQRPPRFRDFPDVLDLRCILCGACADACPV
EGRDGCPPAMEMSEEGPVLHKERCIRCGLCVEVCPTGAIEMGTLHEEVEERVQPP
50 KPARIVVDSDLVCGCGKCESACPSDAITVEETAEVDEERCVLCEVCLEVCVPVAGAIK
LVPTDDELVKRWKEYLEASLRG

<SEQ ID No.:0463;PRT;Methanopyrus kandleri>
VKRRRREIQSNVQVVDVETGEIEPISHRVPVGPNNHPILKEPLRIKLAVRGEEVVDCKV
EMGYCHRGIEKIMEGMPWQKAAFLAERVCGICSHAHNMCFIGGVEKLAEGDPAPR
GLFLRVLVQELDRIQSHLIANAAYFYSIEHETMFVWNMNTREVLDCIEEITGNRILT
5 GWNVVGVRMDVTEQLNNVLETLDAIRDDVITYRRIAKNDPFIKLRSRGVGVITKD
HIRKYRVVGPQARASGVPESDMRLQEPVYPELGFKPVYRKEGDNLARILVRYDECL
QSIELIERIVDELPEGRHRRELEVNAGHVDNRVEAPRGELVYDMELAPGGVVKRVTI
RTPSPNIRVLEAIAPGSPSIADAVATYASLDPCVACNERFVVIDEREGKVLLEGKAR
EVIRACSRSTS
10 <SEQ ID No.:0464;PRT;Methanopyrus kandleri>
MSLKSALKKLKGFVRSRSHVTVVNTGGCNGCDIEILACYTYRYDLEQYGIYYHNNP
RKSDVLIVTGPVTYQWRDKLVKLYHKVPEPKAVVAVGTCACSGGIFNQRGGGRVCG
PVREVIPVDAEVPVGCPPRPEEIVSAVVDVLPALFRSWEFRGGAREAEQA
15 <SEQ ID No.:0465;PRT;Methanopyrus kandleri>
MMRFLIRRNITEEDLNERYAEDPNLVLRICKWILTSYAYRRDIVHRLAELLNVDEDH
VIDVLSRARSCSGLYGLHSEVEQAERLLDNVDDEVITLAVLMDVVSDBGKLSEALEDE
LLRMFEGRKSVPIDRKELTKFFTSRLRERGII
20 <SEQ ID No.:0466;PRT;Methanopyrus kandleri>
MIGFEGRMFVEAVIAGAVAMFLVGLVGLSEYSYRMYPEIFRERRVDPISELLAVLGW
TLLAVSWMRSVPVGIWIAAFLIGYVVNMMPGYGRIETVLGIATFLAALTWLEGLGPR
25 <SEQ ID No.:0467;PRT;Methanopyrus kandleri>
LRSHLCVLSLSLVGMAAILLLEHSIYAKAGGVLLASSVIFLVCARLEHVLHRTEQLAV
VAAILLILGVSIHALRVGHL
30 <SEQ ID No.:0468;PRT;Methanopyrus kandleri>
LIVLETLVGITEAFLVGSVFLGLHRKVMARIQRRPGPPIVQEFLHTLKFMLKEGYAPLT
SAEFLYWMVPVFNVIWWSAAVTISAVYRGNLLPFFALYASYKVLSHGAGVSSGSTYT
KIGGVRHAIMPAGELALACSLISAYFVTGHMDVTGILAWEHAGPLIEHIPFSALAFFT
LLWVDSPYSPLDPSKGYDIVEGYLTEYPGFLRGLMYVAEAIKYYCELWVFQAVFLGI
SDPVSHLLTMGVLTLTLLASMCALTPILNPYQAVGFHVIIASMMFLDFVLVG
35 <SEQ ID No.:0469;PRT;Methanopyrus kandleri>
VRWVPVAVLVADMTLVWADVARPWLVDYRHGVFSALTILAIALTIFVLGWALSPRG
DRDRTPFLGY
40 <SEQ ID No.:0470;PRT;Methanopyrus kandleri>
VYPSGKVLFIPLGDIVPYLSTINMIILAVLLAVLALPILSNTDVYVEIDHRRPRIKAKIVS
PREDKIKAAALVSTLAATGVVTTGDVFNTLFLSLLGISNMGLIGTTVEDEFALECAF
NYGLMCLIASLPLFGGAALILASTGTLSVHELMKMPKGAGGWTLTYGKALLTAGVIG
EAGVGPFYAVKVDSFRRIWGRYAFVIHLTTLLTFSRYLELLAALP
45 <SEQ ID No.:0471;PRT;Methanopyrus kandleri>
MIVPHVVPEITVKMYHVAVAAGIAVGLIAAVDIAADRNP LNRLTMTDALEVGSLLTLLAS
VGTDLAECLILPGLVVGLAELIATAEVLVARYTDGDSLPEFEPLDMEVLRAPTAIMIG
LVVYGVLLTGFTGGAVAGSGAAFYLF SRANRPHYEEWRGMESISGIGWAFWVAGF
50 STFFLHPKAWLLALILAGTGGILVKVGP KLTLLGYAMGYDVRAGARRRVPER
<SEQ ID No.:0472;PRT;Methanopyrus kandleri>

VSVTAKFSRALNAIRRPESMVSVYCLLLAVLALLGLHCGHSYHREQLYPRPAPQVQ
MKAGDPLAPYDRGGVPLESPGVTISQYPQFEPVRGWVTSYLTPTFRWLHNSRHC
GTTIVSHPGGILDEILYYTRGLDTVLESSIMFVAFVTFSWIVRTKTIGEEEMEREGGE

5 <SEQ ID No.:0473;PRT;Methanopyrus kandleri>
VHECEAILYTGAFMIILGTLGAAIGPARSDPVVKSLELATVGVCLVFLAFNHLLALIT
FIAVGAFITPILMRAILRVEASERDREVLEGSERD

10 <SEQ ID No.:0474;PRT;Methanopyrus kandleri>
LNWLLLTSLTACVLGSIATVLRDPLQKLPSIALVKSGMICAVAAEGYLDVAAAGVAL
EAVGTIMFCVYLIRIEEVRSA

15 <SEQ ID No.:0475;PRT;Methanopyrus kandleri>
VISAQAVMAAIVILMSLRLLVARDLYAQMLYLNVVGFGLAGLVATTWRTDMGLIAALC
VFIFSTLESNAVSYTIQKIEIRRAGELD

20 <SEQ ID No.:0476;PRT;Methanopyrus kandleri>
VIGLQEGLQILQIVVGSVLAWLNFVIVDILMGLPEAPGVKGAEAGRSVERRGGDIAG
GYFMGNIVCSPDASAGTLLASSGYCYCLGGPEGGLVAALAVYLGNRLCADPGYAGTL
GSLTATVLVTLYDKVLGMDPANFVAGMVIAIMTIHGIDHPRASRLIGDIARRMGRGAE
K

25 <SEQ ID No.:0477;PRT;Methanopyrus kandleri>
MKDPGLVAVGVAAAVAFGTALALGLPPIQRDKPRRKSWEVSAAFTPVIAAGATVL
VIRVIGYHPIPLAIVGAVVGALSAAFTAYIEKVFPPEAG

30 <SEQ ID No.:0478;PRT;Methanopyrus kandleri>
LGGSRSGGFILSKIIMRPQVTIEDDWIIFEGEEGFVRLPKDPYKVIEDFEEYGYFFDEE
HRRDFAAMYMTLIVEQTPVLLVGPPGTGKTKLVRLIGELYDVPVVVMRGHQEAREQ
EFIGGVDVAALPVADKIAEEYTEVGNMEYEEAIEALKEFIYVGGYLDVVNDARRRG
ACLFIDEVNRFPGYMIPTLIHIFEKDEVIYIPHSPIDFGETGAIMRIGALNPEGKGT
NFDEALLRRVELVPWGEYDVEIYKRIAIESARQIIELTKMAEEVLEDLASLIKDMGKGV
DVAKDVAQTVAIGIKMGYDVTVARNVANKILGDMLLDSEKAEFEARNALERKIK
EKLKPVFKS

35 <SEQ ID No.:0479;PRT;Methanopyrus kandleri>
MDPNHVKDEVGQDPSDYTASLEQAQFVVEGIERRGKFRNPLLSTVQANDMIKSIPN
LSDDQFRQQVRNLLRSTMGELEEWAKDVGQDVRRVLEELKRAEEHGYYVPEELK
ERMEELLQDLQEGPEEREAEAGDGEGPSAGASESPSFVSEEGGGGEPTGESGPT
40 PTESASGVGKGGDPAFTIDRSFPERKKFLKILQSESLKILDEGHEISREFEDVEEGEA
KAHFGWLYGFDKADFLSDVDWERSLEEGYFKNVPLTLRREFRKNKDEPKVAILLDS
SGSMSGDKMEVAATLAAALFETVGIENIGLWAFRSEVHQLKDFEEVINRRKLIKILG
IPAGGGTDPVKPLIKVLDSLENVDYDKCKIYITDAIFMHDDFIRIRNLLSDRDDVELYA
LLIKDEFEHTGPTIFKRITEEDGQVQVQVNPREDREGVREKLRFVDMISD

45 <SEQ ID No.:0480;PRT;Methanopyrus kandleri>
MRSGIRKFRVTHKTFMTRKMDDEMAMVISFVDDRHYDTYKEYMERLKELEVSCAVG
WVNSLGCEAFFPKSVESILENWSVEAASQMIHAGVTDVVLLEHNYSKYLFREFHT
KFRRSWEKEGISYRAPLGELYPDYVNEIILAHNFLRSLSDVVRGMINVSLHRDRMVV
50 KTSRRECSVWYEDIREAMETMQAVERALVG

<SEQ ID No.:0481;PRT;Methanopyrus kandleri>

MNCVGIAVSIIFTSTAPEVPTNLRSKLLSSPSTTSNLSRPESSSSAILARWASDLRK
 GDMKGLLTQTSTVSSGNETRMVLRSTTGITSKLTLNSRDNAESRGSFAYMVKVL
 PTLLDAVVEEVNADKDHSETFRTEPWSGQPDEVVETRYIQLVRRLVGEGRNVLVG
 EPGVGKSTTAIAACEKPPIVLTFGGNLPVSILKTFVNTLRVTGPRRWISVDAVVVG
 5 AVIEGKVRRLPLIDEVWFSVTIVTWCLTRALKIPIIAMLATDKKYAEARKILELAGFE
 VVEIKPDKHTVEEVLRAHGLQGSPRTDNPREELKRFSESSNHSQSDE

<SEQ ID No.:0482;PRT;Methanopyrus kandleri>

MDEVSGNRGLISKTVNDLRDEGLIEPTHRGFALTEEGFLELVRPNTDYEYRNEPVRL
 10 STDGPEVEAFLRVITGRSKTRTGSIATTRCDMRCKFCYYNLVRDHVELTPEEILRE
 AEKRVKAGNREVVIQGASPHLTDLVEAVELIKLELGVGVGTGPLIPLDLLEDLQ
 RAGLDYLLKLSLGRTPEEWEAITGRRRGFEFFWRVVRWCHEHGLEVTFFVGGVVGL
 PGVPPEADAERILSILALNPRKRIVQFNPAQDPARGPLSPLDRLELIYKTVRSKLPED
 VLVKSCCISPMTWSPLYDIRRYLDKVVCMGLGIECREYDGCPTGRVLEQRIMNELYE
 15 KGSVSTEELARRLRARSRLKRRLESMESRGLIRRTESGWTIARRTS

<SEQ ID No.:0483;PRT;Methanopyrus kandleri>

VVESSTTSWRRPVRGHRCSTSTRMLPVKAAREYQEAFSWFPDRVVVCYAMKANF
 NPYLVEHIVDETRAADVSLWEMKAVNAGAETVVVNGNAKSSDEIRAAVERSWSVI
 20 NVDSFEFFQRIEKIARHEGERALVALRVNPKVSPDTHSHIATAVEGSKFGVELEIAER
 VCRRMIESEWVEFLGLHYHIGSQITDLRPFSEALRSVRTFLEDGLIEEISYLNIGGGL
 GIRYRRGEEVPSPHDLAEELQEDLKELHSESSGFDLYLEPGRSIVGEAGILVTSVRQ
 VKRGRRRWVFDVTGMNALIRPALYDAYHEVVVHGGDYSATEKASVAGPLCESGDV
 LAEDRELPIDISEGDLVFLSAGAYCESMASNYNCYPIPGSVVVRNGEITGVRRVQD
 25 YEAFSKTWW

<SEQ ID No.:0484;PRT;Methanopyrus kandleri>

LIVPGTPIHIHRLAKKIMMELDAFEGSRPLDDVDVLIVRGMSRGEDWDLNLQGYL
 ESVLERCDEVDPEPESPEGKELIEELGKFVVERIQAQYADEEPVSVRPVENPMEAV
 30 DAFTQGEIFLDPLGFERLKRDLALGCVAAYTFGRTPDDLGVFLAAWADRSGIGPK
 SVELLVANLKG

<SEQ ID No.:0485;PRT;Methanopyrus kandleri>

LRSCFPDVQSADPQIPAHLTRVGISGIKKLVKIPRRGKRSIVLVSTFNLFDLPAHQK
 35 GIHMSRSHEVLQEVLEELEMSVEGSDTVIEDLCSRISRLLERHDYATRSEVYMTGE
 LILSRRTPVTKLPTQEPYKIIGRAVSKRTDNGIETRKVMGAEVVGLTACPCALEMMR
 EH GKERVKHRLMEELDLEEEEAEDLAKKIVREDVHPMTHNQRGVGTILIEVSDVHR
 VSINDIIEIIEESMSAPTYELLKRPDELKVTCSACENPKFVEDCVREMIRRIVERFDYLP
 DDAVVIVRQVNKESIHKHDAFAERVTTMGELRKELGS
 40

<SEQ ID No.:0486;PRT;Methanopyrus kandleri>

VPGLPIKLVEKAYPEDVGKRAVRMDKASRDRIQVSEGDLVKITGSKTTVARVLPK
 KEDVGKGIVRMDKYERQNASVGEPVEVDRAEEKVAKRVELMPTERVVVPVQAG
 LKEEVEEELTREHEQDILEQIKRYLRSRAQQTPIPATHRDVIPLEVQGKTIAGHVLIK
 45 PDSLLVVGIEPEDATVIGPETEIEVKPYSEDLAKEAEIPDVTYDDIGGLDREIELIREYV
 ELPLKRPELLKELGIKPPKGVLLYGPPGTGKTLAKAVANECGAKFYSSINGPEIMSKY
 YGESEARIREVFEEARKNAPAIYIDEIDAIAPKRGETGEVERRVVAQLLTLMDGLSED
 ERVVVLA TNRPDDIDPALRRPGRFDKEIEIGVPDKEGRKEILQIHTRDMPLADDVDL
 DKLAELTHGFTGADLEALCKSAGLKALRRRAIRKIGAKLAEKGEKEEREVAVKVSELS
 50 DEELMEVLEKGLDRARIPEEKRALRRVLREAEKEEVEVAYTDALDKVLEAEELPE
 IREELKVTMRDFMEALKEIEPSALREVIVEVPDVSWDVGGLEDVKQELKEAVEYPL
 KYPEVYEKLGTRPPKGILLYGPPGTGKTLAKAVANESDANFIAVRGPEVLSKWVGE

SIPGDEVVWAKVDGEAKLPIEDLYELWKEGRDVEVAALTEEGVVWSSVDRVARHR
RRTGLVKIITRTGREVIVTEDHSVFTVRDGIKVDVPTSELSEGDWIVLPARLPAGDSD
EIDGIKIDEDLAFLLGLYVAEGSLTNQKDAVRIHNKDPEVIEEIDRIVREKGWEGRYYE
SDHSYWIKSRLRQLCEKLGTKAREKRLGPLLSLKPELLAAALRGYYTGDGSFSVK
5 PHGRSAIIEATTVSKRLADELLVALQILDIVARRYECDDTKGSTRYRVMITKSEYIRTF
VEKVGFAQSEKNERIRKFLAERKWTRGRSDIPTELIGSPYTYVEVEYISDRVAADGG
LMKAELEHLYFDKIKEIVPLDRDDEYVYDVVEVKLGHNFVGGQGVLLHNSEKKIREIF
QKARQTAPCVIFFDEIDAIAPKRGTEVGGSRVTERIVNQLLTEMGIEATEDVFVIAA
10 TNRPDIIIDEALLRPGRFDRIVYVPPPDEEAMKEIVKIHTRDMPLAEDLTVD DIVEILRR
REREEDAKYTGAIEAVCMEAAMLALREVLDELERIEKESETEEELEARKEALLEEL
RVERRHFKEKAVEKVPPSPVPEKLEEEYEKLEEKYQRLAG

<SEQ ID No.:0487;PRT;Methanopyrus kandleri>

MLLRCLRWLRLLGYPTVAAHEVVDPTKVEDEDEVLFVEFCREHDALLITRDRQLARR
15 ARAVLITADSVPEQIAEVLEFLGDEAFDPDESRCPECNARVRRVTAENPGPFVET
WECPECRRKYWVGGHWRDMEETIDRVKKALRRVQRGHLRG

<SEQ ID No.:0488;PRT;Methanopyrus kandleri>

VGEKLTLEEGEFLVRLARKAIVHYLES GK KIEEKPTQRLAEKRGVFVTLKKYPDDEL
20 RGCIGFPEPIKPLVEATVEAAISAATGDPRFPMPMRDPSEMEEIKIEVSVLTPPKKLEV
DNPKEYVEKIEIGRHGIIVRRGARSGLLLPQVPVEEGWDEIEFLSHACKAGLPPDW
WCSPDCEIYVFEAQVFEEEEPEGPVRERDLAEEQ

<SEQ ID No.:0489;PRT;Methanopyrus kandleri>

LIVMTVFAHPDDMEVHCGGTVRKLSSAGHRVIEVIMSKGNNGGDEEVREREAIEGA
25 KCLGVDRVEFLNHEDGRISVDPESIDAVRALISKFEPDVVFTHSPNDTHQDHRRTFR
IVTSAVSKFPEVTVLMGEGPSTVGFQPVVYVDVTDVLEKKLEAVRVHRSQVERGAIS
EEMVMKTAEFRGMEIGVKYAEAFEAFRISGSLLLG

<SEQ ID No.:0490;PRT;Methanopyrus kandleri>

LERIVVLIPAKHESVEAVEKPLRSVLSQKGVEIEKVIAAGTEDDHRRFSRRFADDDI
30 VEVVKAGGNVKGETVNNALKRV SARADYVFLIDAGDELGSDRYIRELLEEDATLAFG
RIRYCGRNLTGLMVG LQFDVVSSGISFWGNVVGSA PVFTTGT LFKATFLLEEGLPE
NLAEDVTLGLIHTWRKVGFVYRPDLEWMDDPASLKENFFQQSRWWAGMYQACA
35 EALRSRNLP GIGFAVFLG SLLASFLT TYILPLVYPWTILISLAGRMIYSVLAAL ECSNR
RGPLWALAVMPCQFMWTF FVEWAAVYGLIWLAI RGNVWYRTTRASEGDDHD

<SEQ ID No.:0491;PRT;Methanopyrus kandleri>

LRAALALEDTIVHGELFGSPREAEGEVVFNTSHTGFQEALTDPSYRGQILIMTFPM
40 QGNYGILPEVGESDRVQVEGFVRYLHDGPIHPRAEITLDEFLQDHGVPGIAGVDTR
MLTRKIRTEGAMRGVLVPYEPDDQPSDEELLERVREVPHISEMDLVPQVSVREEYR
FSDGKPEIVVIDCGVKRSILRELAKRGAGVTVVPYDTS AQEIMDIDPDGVVVSNGPG
DPKRVRET VETVRELIGQVPLMGICLGNQILGLAEGGDTFKLKFGHRGANQPVKDL
DKDRVYITSQNHGFALDPDSL RDTPLRVRVWNVNDGTVEGVVHTDAPAFSVQFHP
45 EAGPGPWDTKWV FDEFLAMCREH

<SEQ ID No.:0492;PRT;Methanopyrus kandleri>

LGLGVALDIKEGKVWVRRSPDVREYIPISRRYDL PDDPHELATLLVERYDLDFVYVAD
50 LDAILRGEPADTSDALESLEKPVFVDVGACEPDLPSHAHRVIPTECYDDKSEYIEDLE
EDES AVAGLDLNGSEILGPWDGVGDFLDTVVEVVYRRDPGVLVIDVGAVGSKEGPP
YEAATSVGMYSTALIGGGVGHPEHVKLALGTPGVSGVILGTILFEGVDPMKLEQARR
EGKRLRVHHMGLEEEYLNLIKEGKKTVEGRVKDDKRARIKPGDKILFNRRLLVKVID

VREYDSFEEMLREEGLENLVLPNVDSEEGVEIYRRFYSSGKEKMFGVLAIEIEPIMDL
WEGICD

<SEQ ID No.:0493;PRT;Methanopyrus kandleri>

5 MDVTILEKLYRNSGAEESLRTQVQSVISDFDALEEIRKNFRAWAVLRIRGPEVEEA
AEEIVEEFDTVRSLFDVSPGDVIYGRIVDLRYVGYGIYVDIGVVGPEVVDALVPLYRL
REQLLDGEKASIRDIGRSFGFVENMPLEVEIVEVNEERGEIEARLTDEQVEYLLEMA
ADPYDRMIVAGITRKRLQRLNLRAGFGRRVIRIERWGLENNEVVFDEGVDAPGVLAKE
10 GPYLRGGEVELIYDDKFLERIGFIPSPEGPIL

<SEQ ID No.:0494;PRT;Methanopyrus kandleri>

10 LRDPIRDLERVGCPEHVIHCKAVCRLAEEMAERCEEDVDNLVVRTGALLHDIGRAR
THGIDHAVVGANIVSELGYPKEVVRIVERHIGAGIPKDEAKKGLPPKDYIPETLEEKI
15 VAHADNLTFGTEHVPIKVVRKFSERLGEDSPAVKRLELHNLVDLNAIPPELTRW

<SEQ ID No.:0495;PRT;Methanopyrus kandleri>

15 VGGSNVYAELGEEDLEVLRDVTLSLLDSEKGVDPVAKRTVDVILKREAIDEEIAEEL
GVDPREVRKVLYKLHERGVVTFRKERREEYRYPVYSWRLNLREVLRRCLEERRRE
20 LEEVERALSNDMSHPMFHCGNDDCPRMSFEEAMEHEFRCPKCGEVLEEVDLTEE
RRELERLAEELKVEIRRLLEELRERLG

<SEQ ID No.:0496;PRT;Methanopyrus kandleri>

25 VLRLPEFLVFIDHPSKKEVPDSEVEVARRRVEQLGGKIVWSIAGSIRKYHPDVRYVE
RLRKEGYELALHLSPGYIGLHRTSLATGVPEGKIKEAVYDALRIVDGAKYLTTCGPLH
TALFRGKVPRRGWKDDLGPHELPSVVYGLGQAAETGLDLLVGARSPEWIKGILDE
LEVKYIEGIGIDNYTIDDEKPEEAAKMVAEGECSAVIVHPRKDTFRRLHKFITCLKRIQ

<SEQ ID No.:0497;PRT;Methanopyrus kandleri>

30 LTLDERDLELIREELGRDPNATERAMFENMWSEHCAYRSTRHLLRQLPSEADHVIV
GPGDDAAVVAIDDEWAVVVGIESHNHPSYVDPYNGAATGVGGIVRDVLSMGAFPIA
LLDPLRFGPLDGERVPYLVLDGVVRGISDYGNRIGVPTVGGELEFDPSYERNPLNV
MCVGIVRRSEIVRGRADRPGLVLVLVGARTGRDGIGGAFASEELGEESEEDRPA
VQIGDPFTERQLIIAIREAVERGLVKGCKDLGAAGLTCAATEMAADGGTGVEIDVFKV
35 PLREEGMEPWWEIMLSSESQERMLLVAPEDVDEVIEICRKYGLEASVVGRTDDGYL
TVKDGDDVIARVPAEFLADGAPEVEWEEEPYSYPENVDPPEPDLVRSVLSSPN
VSPALREWVYRQYDHEVQGRVVKPGHDAAVMWLQHEGLEDVALALTDDSNPRH
VLIDPKTGTEGCVAEALRNLATVGAEPCLVDCLNFGSPENPRVYYQLRRSIEGLGK
AAREFEVPVVGGNVSLYNEHEVDGPVNPTPVIGAVGVIRGLDYLEDFPREPEEGEA
40 VSTGGLLAABAELLGPVGASLSLSEVPNSVSRWDFLLLSHSGRAIVTTDRPDDVLG
AEEEAGVPAQVVGEVTGDGVLRISVGPVDVSLDREELEELWRSPLHYLE

<SEQ ID No.:0498;PRT;Methanopyrus kandleri>

45 VERIRARLNLGETLLEWERVLCARCDGCGACESRCPNDVPRRLFNVLAASGRFEEAL
SVASDCTVCGLCERLCPHNIPYTEVITDLRREPTPEAVRRVRRTGTPYGRKLADES
EPLQGDGVAILGCTIRSRPEWLRRVIEIVRRAGLATLGEDEPCCMNFARKRGEEVPE
ETVQRWCSLFDDFDTVVVFCPGCYDFCVELDERPLYAEIAEFDGIPEGAAYKSP
CHLVRHGVDHVLRLPDVELPPRRHRCCGGGALVRKPSESTVRAYERLGKPVLT
50 PCPMCVTTLLEGVIDVRPLWDHVVDLSR

<SEQ ID No.:0499;PRT;Methanopyrus kandleri>

VPCKVRIRGIYSTALTKICLDHGFIVTQPSDDIRRRFPDAEFDSGSPDVDVRDTRNRH
GIEIQGPADDVRELVDILQSEVWATVTADKIGEGSVFKGVVREIDDRAGVAVVDLGN
GLQGFLSEDESEVVEEGEELVVQVAKSVSDGPKLTTEVTVAGEYAVLVPVEGIRV
SRKIRDERERERLRLGEALVPEGWGLIWRTAAGKSGEELAAEIDDLIEERKQLFK
5 RAEEMSEPGPIRDVREMELEIHSLAKSRLDSVRSEVLPTMVGHYFKCRSLAGSVA
VDTVEPFLDDLDEEVVAERLIRCLTRSEGPSEGDRIDIVHVKPGQGVKKLGGNPKVV
EYDPVEGILKVRREMRGPGFYDGIDKPIEKGDY AISILPDGSMVTVHQYFNKDGEK
GRYYNIGTPLEVFKNCVRYVDLEVDVVEPEEGEREIIDEEDLERAVDSGLIPEELAE
10 ALETAKRVEKRGMKVEVKPYPVWKGFEHG

<SEQ ID No.:0500;PRT;Methanopyrus kandleri>
MGDPEVLLEVYEVIRNRIEERPEGSYVAELTEDDDTKPAINKICEKIIIESGELILAAKD
GDREGVYESTDLIFHVLVLLAYLGIEIGEVFDEFERRK

<SEQ ID No.:0501;PRT;Methanopyrus kandleri>
MERVVIVGAGPAGLFAAREVALRAERDVEVVVEEQGPSLEDRLESGEVMRGVGG
GGLSDGVLNLRPDVGGDLVSIVGDKRSANELVEYVDEVFLKHGAPKELKVPEGPKV
EEIALRAAADVEFVRIPQRHIGSDNLPKVGISLVRELEELGVKIVPETRVERILADE
VRGVKLEDGREVEADYVIAAPGRVGANWMMHEAKRLGLRLRYNPIDVGVRVEVPR
20 IVMEPVVEVSLDPKFRTRAPTYDDPVRTFCVCHGGYVVKENYEGFVGVNHGHSYRR
KKSSENTNFAFLVSVDLTEPVENTIEYGRSIGRLATTIGGNRPPIIQLRGLRRGRSTW
DRINRSHVTPTLMDVTPGDISMALPHRVTVDIIEGLERLDEVIPGVASDSTLLYAPEIK
FYSARVETNEDLETRVENLFVAGDGAGLSRDIVNAAATGVIAGRAVAERIG

<SEQ ID No.:0502;PRT;Methanopyrus kandleri>
MEPIFQTLALLIATQTGVEHDTGCCTVLVHVHHGCDVVAYRRDAKFP AEILVRTEW
AGRRAIKEYKIQGGYFCHTVITEDGWIVTIGGRDIPEVNRKLEKLGAEIVSKGRIKKDE
IEKAGELLKEARWGHFVVKSPNDIVGVASYDYRISSPERIDMFKIKDGEYVKVTNNP
RYYDRGRSEEFGKNPIDAAIKIAGKDPYGLHRRDIITYKLTVDETSSSVKWWASYDG
30 RALLGGASGEPDPIRFMGKTIAANEIPRVPRRKPLGEVILRVCREHEGKGELPNPAA
VAAALISGAVFVAFLGQLSLQQRNLY

<SEQ ID No.:0503;PRT;Methanopyrus kandleri>
MNGKILVVTGVAVCLVLATGVVAFNPANKVKEFDPKHALNFAKNICKLGPYGGNE
35 AELKAANIMEAELKKYGLNVHEEKVDLGGGKYTYNVIGEIKGTDESNKYVIVGSHIDS
PGFCEGATDDAAAMGIQVEMARVLAKNFRPKKTVLIIGFGGEELWFKGSEAFVRKH
PKIKNCEAVIDLNCVGAGQNVFLTQKSAPKPVGEDPKLIKLLEECAKELGHPVTVG
DTTYPSTDTYPFYHNEIKRVPVCQVMSQPFEVPPWSESNTADKLDPKDMEKVGETV
TLAVVKLTAEPASKPLWEAKRAEESAGGGWPAPMWWAPALLGVAAALLRSRGR

<SEQ ID No.:0504;PRT;Methanopyrus kandleri>
LRALLIVDMIRDFVEEGAPLEVPKARRLVPRIARLADEFRERGDLVVHVWDEHYDD
PEFKVWGEHAVAGTEGAEPVEELKPEDGDLVVRKRKYSGFYGTSLDYDLRSRNVK
EIYLTGVCTDICVLFTCADALMRGYRVVVRDCVASLEEEESHFRFALKHMEKLGAEVV
45 DSEELGD

<SEQ ID No.:0505;PRT;Methanopyrus kandleri>
LTAVKRILALVDGEHYIPVTREALETVEELDLGELVGAVFIGGTEKISEPEAVKRELGV
RVWLSESEDEIPVDMIVKVEEEDVDVLDLSDPEVVSNDNRFEIASAVLSAGAEYW
50 CPDLRLKPVFHDVLEKPSLRRIIGTGKRVGKTAVSAYTCRVLNARGYNPCVVMGR
GGPREPEIVRGDEIELTPEYLLKEAEKGKHAASDHWEDALLSRIPTVGCRRCAGGL
AGRTFTTNIVRGAKIANELPADFVVVEGSGAAVPPIKTDAGIVIVGANQPLEHIGGYL

GPYRIRMCDLAIITMCEEPMADDAKIRKVERTVREAGDGIEVVLSVFRPKPTEDVEG
 KRAMFVTTAPEEVVSRLVEHLEEEYGCEIVGTSPHLSNRPKLRKDLEKYIDDADILLT
 ELKAAAVDVATREALKAGLGVVYVDNVPPIAVGGDYDHVGD AVENVAELADRFEFEG

5 <SEQ ID No.:0506;PRT;Methanopyrus kandleri>
 VRKKLPVAPFDRALRAVGEDVRVSRKASETLRDHVQRLAEEIGKRAGEIAASRGSR
 FVERVDVERAFAEVVFGIDSD

10 <SEQ ID No.:0507;PRT;Methanopyrus kandleri>
 LTKVLVEPDPEEVKQLSEALGRQPVILAGICEAEYRGRAESVAGPALRIAMCKPDGT
 FILHNAMEKREPTNWNPA PSRQSIEVRDGCVVLR SRRLDVPEEVVVYFHKVLLACS
 LPKEGAKSEDSVFSLFRSEEDMKRVIREDP SVIEPGFRPVGEEVECGAGVADVVG
 DEEGRFVVLELKRTRAGVSAASQLRRYVEAFREER GEEVRGILVAPSVTDR CRRL
 EKYGLEWKKLEPVPLRDDGGKKQCTLTEFLAGEGD

15 <SEQ ID No.:0508;PRT;Methanopyrus kandleri>
 VVRVKICGITRPEDAATADEAGTDAVGCVVEVPVSTPRKVS AEHANEVFSVSPFV
 SRVAVLMDNLEPIDRLEEATAVQLHGTEDPETCEELSELGLDVIKTFWVDQRGSWW
 LGEELIGDEVLA EYCEIVDAVLLDTKSAEGGGSGERHDWDASARLVRRLDVPVILAG
 20 GLNPENVREAVEKVRPYAVDTSSGVEKEPGIKDPEAIAEFVRATKSV

<SEQ ID No.:0509;PRT;Methanopyrus kandleri>
 MPVTASSQLQFHTPDAGVKPDVYWADFLGYPTGALFREVIMPDSRGEIVTPPTHLG
 GEPYRQNSEIVQKLVERWEELSEKPNDRKVIALVYYDWPPGRESIRASGLDVFGSL
 25 VNILANLKAAGYNVSTPWDDQLLKIVQLERERRWDEAAALVRNLSQELARMIELYGV
 NVGWWHGDYLRAMYDRHAYLATIPVSEY LKWYDQLPEPVRLYVEYGIPGLLYGYA
 EPLHRPLEGEALETLSRNLSAMLRDIETLLSNLGV PDDTDAMKALRELADALLRYAA
 GKAGHDELERAFRRRAVDLGRKLEQRYHTGIFGWGPPPGDVMVVDNKFVVPGLKF
 GNIVLLPQPPRGLLWGMAAYHSLLLPPPHYLLAVY LWLKHHVDVIVHVGAGHTLEW
 30 LPLRRTFLSHLDFPTVLLGDVPHVYLWCPTSGELYNVKWRTSAVLSYLP SAPSTA
 YDFYLNLT LKLLHSCFHVFEGNPEVEEKLKP VIMELLKRTRVYEWMLT WEDVERM
 ARTDFNRLVSELHSYLHMMQAHGESPTPVQLTRHLHVYGLVTSEEIREYVSALLFR
 KYLELVSKTYGGDLESILSPENIEKYGDKALELFDLWKEWQSLIDHPSELRF RYPEL
 YREMERIRDLV VTSAKLEIENLLRVLDGQSV PVGPPGDPTVDTSVLPTGRMLCLLNP
 35 ELIPSETAWMLSDGITLKQRTLFVLSAADVLNDRGLSLAVLLRSSGVDRVGERYVLS
 GSPVYSPVLVCQGLEAIFAQTPAGRALLKAHVEAVLRAPKDLFAVANLLKTL SDECE
 DP ELRESLASIRLD PGLLEKGLVLRKFSASLGDVDVRPTFRPDSIWYAAWAVKFLY
 DVQVNGTPIEKAAIRAALGVYCPADYTLGVKAATERLKPEEWEILARSLSAKLE NVLT
 PEGSESAPGLLRIDLLIVDAVLKPVTDR LWGVLAEDAIEFYGGLLAVARLIRAGLPDP
 40 LVLDEVSSL CIRQLAGELSREWHSLWMNKDWLLSLRTPGEANDFLERVSR LMAWM
 ILLGPTIVKPTTMAERA IAGVLGQLFFELVQRLVFDREVVEHLEKLN PYVVESIAGR VF
 VLLDSDFGLQLLRRSYHYQVLCQLGKLEEA EKWARRFRETARRASLETFR RIVSKY
 GPCGCLAIVLNPVLRGIVEELAPAAELLVPN PFSAGVSPVISTVSNSSVGRSPAVSAA
 RARGSTPKFTSSAAGTTATTTGVRGSPSNRPRRVEPVPGISLSGGSPARSVSVGST
 45 GSAVSAKVLKRQGSAGSPVPPIRLRYLVMAAVVGTLCWL VWMRRASVPIKPTW

<SEQ ID No.:0510;PRT;Methanopyrus kandleri>
 VSRLYSIVAVATMVLLTGAAADLQEYKEAYSAAAKIEEYGEKV KESLNIIGGFQPPCG
 LKVIPTAYPYMAFKDDKDAISKVFQGT DVAESGSWTEVGP GDFRALIYGIHELGENW
 50 FERVKVADLAQKPADYALKVHEETHAWEGAVEKVGETWEDWENHKG DENLKTAI
 ASRVLA VLGVLVSENWRAIFNEVNKAAQIAENVGRVTIPAGVYGNDSPIELDFSKCE
 SPEDVVNVIKAAFGDLTPDRVIELIDSEAKYFGLGDKFVENYMEGGQYQPHEGGFT

VDEMKDVIEKFKSGKDIYGQELSEEALAFAILFNIEDVWATYEEYVHQYGHFFPPAE
 SDLKLACDKIEENAKIVEDVLNKLNAWADVGITKAEFESNPLECAPAVKDWAVGELF
 GVVEKLEKRKIPLSPVVLAGLLAALAVLRRR

5 <SEQ ID No.:0511;PRT;Methanopyrus kandleri>

MVSPFSIQPRPPTPIMLIRGCGNTSLTHDKVLTFFVATLCLLGAADLVSDVQQRC
 EQAVDWLLTNQQPDGGWLYEGYGDKSSAMDTGVVLLGLCEAYDRLPQDQQCKV
 REAVDRGVEYILKCWDGDRKMFWDYPDGGGKEEYMPMYTVHALMGLIAVEKKFP
 DIAEKHGVSKYIDEALEKLLSMQNDDGSWSNFGPGSWSSPGRCTGLVWLAEWS
 10 GRYGPSDERIAKGLKYIENHLEKSPLGGLISSNGPKIDFTVWDMALAFYFSGDEYYRS
 FVPKLQEGVLGFQHKDDEFAGAFAAHTSVYDSEYGPEGTAAPCPHKHTARVLFALML
 TGADPNDDRVRKKAVEFLLNTKSQSEGAWFWPTMNDPSKPDNNPMKAYCTGWCLA
 ALGAWLQKVPKKGHGPVSPMLVALAFIPARRAWQAGTP

15 <SEQ ID No.:0512;PRT;Methanopyrus kandleri>

MSEALQRLREFAKQVLKCEKDEPVRIPKRRTSNIRYDPEREFTLGPDKLERRPRT
 LKGSKKLAQMLSVAFAKELVEKGRSATLREIYYTSEGWEVDFKDQRESDAIVEDLE
 ATLGLKREEFGVWPEEDGAAYVGDLLVREDGVEIHAERAGISGYNIPPNVDAVEILD
 CGAERVIAVETMGMYRRLVQERAHEKLNALIVGLKGQAARATRRLRLNEELGLP
 20 VYVFTDGDGPYGWHIYMVIRSGSAKAAHLNEELACPDAKFIGVTATDIVEYDLPTPL
 KKTDYKRIEELRRDPRYYDPFWKKELDLLEKLGKKAQQAFKYSLDYVVKEYLPA
 KLDELE

<SEQ ID No.:0513;PRT;Methanopyrus kandleri>

25 LAELADEFYESAERVKIPKDRIGVLIGKDGETKRYIEEKTGVELRIDSKTGEVEIRPTE
 RVKDPLDLIAKECVLAIGRGFSPERAFRLREEDASLEVIDLYELVGRNPKALERQR
 ARIIGREGRTRQLIEELSGADVSRGKTVALIGTPRQLQIARKAIEMLASGAPHGRVY
 RFLEDQRRKMKREKLRLWKDSEPPDIL

30 <SEQ ID No.:0514;PRT;Methanopyrus kandleri>

LTLSEDKYFSAIEELEPKPGKVKRLEKTLEDLKVEEEVFDQYTLMTLYELSRRGYIDG
 LMGFVKTGKEANVARGVRGDELVAVKIYRAATSDFRMMWRYIRGDPFRKNIGRKR
 HRIVYAWTEKEFKNLTRAYEAGVRCPEPIAHMNNVLIMEFIGDDEGNPYPLMKDNP
 PEEYYAEDVLSNILLDDYRRMYRKAEIVHGDLDSEYNILYGGKGDYRIIDFSQGVLDH
 35 PIAEELLIRDLRNLIRFFERLSVDPTPLEEALEYVRG

<SEQ ID No.:0515;PRT;Methanopyrus kandleri>

40 MGKRIDDETLKKIRLPKEGEIFGVVEKMLGNDRVQVRCVDGKTRVARIPGKMRKRV
 WIREGDVVLVKPWEFQPERADVTWRYTRVQVDWLKRKGKLDERTVKLLEEIPGA

<SEQ ID No.:0516;PRT;Methanopyrus kandleri>

45 VDVEERLKLVTRNAVEVVTEELRQLLEEKEEPVAYVGFEPGSKVHLGHKLVIDKMI
 DLQEAGFHVILLADLHAYLNEKGTLEEVRELADYNRRCFAMGLDPNKTEFVLGSE
 FQLDEDYALDVYRMARHTTMRRARRSMDMIARSEENPPVSQVVYPLMQALDIVHL
 NVDLAVGGLEQRKIHMLARDVLPKLGYSPTCLHTPIIHGLDGDEKMSSSKNNFIAV
 DDEPEVIREKLRKAYCPAREAEGNPILYRYFIFREYDEV TIERPEKYGGDVITYTSY
 EELERDFVDGELHPLDLKENAAGYLSEILKPVRKAVSAPS

<SEQ ID No.:0517;PRT;Methanopyrus kandleri>

50 LICHRCGREVDTTIDGLCPECYLEEHPMIEVPEGLEVRVCAQCLARHTGLRWEDPP
 EGVGSIEELLVEYVLRELEENLRTLDPDVYVRIKPLEVKGEPGGPGARVLVELLAEGE
 WEVGGEVLTRKYHLKVPVWFALCDRCMKFRSGYYEAILQVRSLRGKLTEREREVEE

NFVTEAAASLLERDPMAYISDVEYPEEGIDFYIGSLNAARKLARRLVDAYGGTVGES
HKLVGFDREERSKRKYKAAISVRIPHFRKGDILLVDGQPPLYVTGLGERCSLRHLISREV
VKRKWEELKGVEVLKPEPAVVIEDTPPRVVLERTGETVECYESDVDLHVQQRVYVIL
LKGVAVVVPEEYL

5

<SEQ ID No.:0518;PRT;Methanopyrus kandleri>
VLALNVDTSLVENLVYFIVSIILFWLFIIRVYYQVVLFRRIEGEVERIRKIDEKVQQMVVR
RARCDREEAETLVQRAANLFVVQPVLDPHGIIERLENLIERSEDKFRSYARVLTGK
RDGVEVDNMSMALTCVFSIHVIAQYLRHLLLSAKKTNNIQLLLLITMLLPTFKQFVKSN
10 YEGAKAFLKCVPIGDSVGPMAARLIGDSPVREVEKGTVAEKELEGRLLIVKAHG
PGGNLGRLLGRAVKKLVREYGDVSKIITIDAALKLEGEKTGKVSEGVGVAMGDPGHE
SYKIEQIAADEGIDLDAVAIKMSATEAVMPMPKSVVDAVEEAAERALELAKEAPEDST
VIIVGVGNTVGIPDNRPYVSNNGGEG

15

<SEQ ID No.:0519;PRT;Methanopyrus kandleri>
LDVRVVLVEPKYDGNIGHVARVMKNFGVKELFLVRPRSELGEVAIARAMHALDLEN
AVIVNTLEEAIEDVEAAIATTAVLASTPARNPMPWEVREAFSDYEKIAVVFPGPEDR
GLRTWEVELCDATLHIPTSEEYRSMNLSSHVAVVLYELKKMEYVPERYGRAATKRE
KEVLVKSLDDLKALNFDSTRRENVCTTFRRFLARARCTDKEIKALLWIFEKAKRRV
20 LGVKRRN

20

<SEQ ID No.:0520;PRT;Methanopyrus kandleri>
LLEGMVVNEFRERRNTNYWDGEVEIETEDGKLKLRMPGTIAGWLTKGTRVRVHGAD
GVQSVDFVKDDVEVERRYEDWVVPVWPPFEMETEVEKRDTLGRGVYEURLRARE
25 AIYREDFEAIVGLEQYHYASDKDVAVWGCNECGRSIRANLKPEECPGCGSSRIEL
RTIRGSLPASRFMVVELLNGEEYEPDVLAYVRVDPPPIKLNRRLDGKVERNIREKVF
GKDWFHPTFEPKRGKTIEDILSACDTKAARIARVVHPEYRADGIGRASVQAAVRW
VKERRIPEMKSEKHLIEVIAQMARYHPIFESVGFVYLWDTGSGRPYLVRPLSEDAKR
KVSRFIKTDKIARQHGGRLYRSRLRKLEVEPLDGPVKVRLHKMFSTELDVKGLPKD
30 VVKLLEAFGLVLRHQIQQYALQDVNLRIEPGELVVVVGPSGAGKTTLVRMIMGAHEEF
IENVRRRIIRELSTPVVSRALSSMGNTNPKEVADKLKEMYQPDKGKVSPLPENTELSA
MIPGEVEPEIDPGVTIIEDLWSVTGDVNVAVEILNRSGISDAVLRYSPYERLSPGQKE
RVRLARMIAEGANLIVVDEFCSHLDPKTAMRVARSFSEMCRELEITALIITHRAEVIDA
LAPDKLVVVGGLVGVVEEKS

35

<SEQ ID No.:0521;PRT;Methanopyrus kandleri>
VFERIMVPTDGSENAKQAAKAAIEIAKKEDATLIVIHVIPLWSPLGTKPSFTLPEEIVKE
AEKIVNEIAEMAKEEGIDVETLVVESPSVVQGVIEEAKERDVDLIVMGTRGLSGVKGL
ILGSTTKGVLSRSPCPVLAIPPEGEGEEGEEG

40

<SEQ ID No.:0522;PRT;Methanopyrus kandleri>
MARRHFEKLDEKRVREPVGPNKDCEYYPCHFDGQDCTWCFCPLYPCLDDEELGEW
IKTKNGSEVWSECKDCHLIHRPEPAKVLLRELLSVGNNGSVLRGAERLEEDPELKEKVL
ESVKRADRKHRQHSSRR

45

<SEQ ID No.:0523;PRT;Methanopyrus kandleri>
MSVKPKFANLILDGVKNVEVRRWLPGTILRERTCIVYASSPLCAVLGEVTIEEIKKVAI
QSEEDLAEIAELAKASEDLRRYLEGRDHAYLITLDGPVRYPNPLPLEDLRRLIKERL
NMDFHPNPLFRVDQEVNLNVRSVAVGVSDRLF

50

<SEQ ID No.:0524;PRT;Methanopyrus kandleri>

- MAEVSFGIELLPDDKPTKIAHLIKVAEDNGFEYAWICDHYNNYSYMGVLTAAVITSKI
KLGPITNPYTRHPLITASNIATLDWISGGRAIIGMGPGDKATFDKMGLPFPCKIPIWN
PEAEDEVGPATAIREVKEVIYQYLEGGPVEYEGKYVKTGTADV NARS IQGSDIPFYM
GAQGPIMLKTAGEIADGVLVNASNPKDFEVAVPKIEEAGKEAGRSLDEIDVAAYTCF
5 SIDKDEDKAIEATKIVVAFIVMGSPDVVLERHGIDTEKAEQIAEAIGKGDFTAGLVD
EDMIEAFSIAGDPDTVVDKIEELLKAGVTQVVVGSPIGPDKEKAIELVGQEVIPHFKE
- <SEQ ID No.:0525;PRT;Methanopyrus kandleri>
VRSVSVGEVARRDVITGSPTETAVEIAYKMREHGIGSVVIVNEKDEPIGIITERDLVIK
10 VVSQGNPDEVIARDIMSQPVITVEEDMEVNEAVKLMVDKGIRRLPIVDDNGKLIGIV
TMQDILQVEPYLVATIEEEMKKFQEELEEELEVSEIIEGVCDLCETYSEELRFVDGWV
VCPECYEDILGREIEDRELEE
- <SEQ ID No.:0526;PRT;Methanopyrus kandleri>
15 LPDTSVMRLATTNVVSMPTATVKS AVDTMIRYGFRRIPVTEPGELELVGIMTGKDV
LDYLVGERRKIIERRYGSTFLPALHEPVRSLMRTEVYVITPYDTRKAVRTMFEEV
GALPIVKDKKLVGIITERDIMADLYDVLEDTRVEEIMTEDPETVPSDITVLEAAEIMVD
REFRRLPVVENGRCLGLVTATDVLHHVSSMATETSPDASVEEVMDVPVEEIMTEDV
ITIEPDVNIEEAALTMKGANVGS LVVTEGNDVIGIITERDIMYIAERM
- 20 <SEQ ID No.:0527;PRT;Methanopyrus kandleri>
LDRKDVLCALVAFLVGAVVSSPSLDYGWNWFP SGADARGHMTKVWMLEKLWSMG
DVPYPKWSEYWYCGYPFLWFYPPPLAYFIPALMTHLAKTDVLTAWKWWTWLAYS LA
GPSVYASARLMGASPLGSLIAAVAYQTSYNHIEITFTEGRIPTVAAIVFYALVPGLLVA
25 VYRRVWERGRWAGYLALVLSLTILMHSSGLAAITVCLAYVALRISRSWTLWAVGK
EELPSILPEVPGHAWVLFALLSVLAVSWWLMPALEYRTYSYTTKPKWWISMSSVH
DPWEFFVPDYWKTRYAKYVGAIQFLLGWAGLILAARRRPRTFLPFAIMTGVALLLSF
GLVLQKPMERIGFEPKWFLMFSAVILCTFVAFVVDNFRFLRRHTVLIMICSM MVDA
AIGLKYAYRPVHYTVSELSALLWMREHTGPWDRVATVGYRALWGM EPYITGAPSV
30 FGWYREGTPIRDVVVQYQRSFKRVEPNKALKIGDVLGVRFLILSSRKPYAKRMITEL
ERVGV RPIRDYRWVKVYEFNPTMGYEIDDIKSVFLGNKYRYMRLCKLLRYDPKYAP
AYAFTRI PDCLVRYAHPQVVMDRHPSP EEVRLKEFGVKEILVLD RYHKFKTKIF
GINIVHDRPLRIVKM LPKRNLKPIRVDLGHAWFKVYGRGWVWVKVPYFPCWIPDRG
VRLGGIDNMILLRVPSPTTVKFVWNPHPLWIALSAFSLCVSLYLTFSRQWRT
- 35 <SEQ ID No.:0528;PRT;Methanopyrus kandleri>
VADPSKDVKKLSMILESEEW RVEKAIERGTIRRVRTSFPGFVYYRTVREFAGFERGT
LIVPSHGLLLRGFPKIERALLLEPALRSRFG EVGKVIVEEKMNGHNVRVFELDGEVYA
ATRGG LICPYTTHKLRNMFED ELKQFFEDYPGT VVCGEFVGKENPYVSREYPEAR D
40 VGFFVFDVRDP SGRFWSYEEKLVDEYGLERVRCFGEFEVSEVEEIH RIVRELDRE
GREGIVIKDPDRKL PPLKYTTTHSAHVEEIEWAFRFAFDLGRDFVLTRTIREGFQSFE
WCEKDRELKRRGAEIGRAIVEGLRRAVEQVVEEGEAYEEIPLTFESREWFERYEDF
VKRVTGGTHSLKIIEEKEDGTVRAVL RKRYFGTGDKVSRILEEGVL
- 45 <SEQ ID No.:0529;PRT;Methanopyrus kandleri>
LIEVEIPGRGELRLEHLVLDYNGT IASGGKLLSVVEPLQELTEIVHVVASADTYGT V
EDELNDAGLDIEVYRV SAGNEREDKAELIEELGPEVCAAVGNGANDELMLRRAALGI
CVIGPEGACSR TLLNAHV VVREPREALELLLDPKALRATMRC
- 50 <SEQ ID No.:0530;PRT;Methanopyrus kandleri>
VLALRVLLKGKILIGGRV REREVLAE DGWIVKIGKRLNEEADLTLELGKRELAVPAPID
LHVHCRDPHPDYPFGFKTETRRFLLGGVATVVDMPNTRPAPTTPETYYEKEELARE

- 5 NAEIEVIVAGGVRDSQCTKELVEAGAYVLGEVFLATSTDAPAVPWSTLPEIFRELS
 DGPLTIFHPELDELVAERPARNLYEHLKNRPPEAETTAVGLLAGLKVRYP
 TLPESVKIAKGADITVDVTPHHLFFDVLRVDPEDPVFKVNPPLRGRHRLG
 RGDVDVLASDHAPHILEDEFEDVPSGVTGGEIILPAALT LHRRFGLSLRDA
 VAMITCR
 PAKLLGRDDLGEVAVGKRARITVVRMREFVVRAEFGEEDRKFPYDGM
 RMFGEPV
 KLIDGTKVYDLKESRREGKPVILEGE
- 10 <SEQ ID No.:0531;PRT;Methanopyrus kandleri>
 VSELPTGARVLVECLKEEGVEHIFGYPPGGAVLPIYDEIYDEV
 SIEHILVRHEQGAAHA
 ADGYARVKGKPGVCMATSGPGATNLVTGIATAYMDSSPVIAITGQVPTT
 MIGKDAF
 QEVDAGVGFMPITKHNYQIGKPEEIPVVEKFAKIAITGRPGPVHIDVPK
 DVQEA
 EVD
 VEIPKTVEVEGLNVVKRGHPVQIKRAAELLAE
 AERP
 VILAGGGCVISNATRELIELAEL
 LGAPVATTLMGKGAFPEDHPLALGMAGMHG
 TKAANYALTECDVLLAVGCRFS
 DRT
 TGDPSGFAPEAKIIHIDIDPAEIGKNIPVDVPIV
 GDAKLVLRLDIKELKRRKYLRERKRW
 15 GERIEELKAEVEMPPESTESDQRISPRELVRVLHEALKDRDYILTTDVGQ
 NQMWMA
 RYFPVEEPRRFISSGGLGTMGFGLPAALGAKVAAPEKTVVAVVG
 DGGFLMTAQELA
 TAVDNDIEVKVFVMDNRLLGMVAQWQRLFYDERLSESKLDEKTDIVK
 LTESYGAAGI
 TVEEPSELESAVEEAFETPGTVVVDVFVDPEEIPMVPPGGELRDILGEK
- 20 <SEQ ID No.:0532;PRT;Methanopyrus kandleri>
 MDFEEYLEKWFKGETTEVGIYMAMAIVAREQGYPEVCDLLEQIAMDEAR
 HAAAAALI
 AGKVENSLIEGLIEKMEEMIEGEKNAYETRMDEADHHSDELDDDEITLL
 KATAYDEKH
 HRKMLKAALEKLKE
- 25 <SEQ ID No.:0533;PRT;Methanopyrus kandleri>
 LRYVDAHVHLDVRSYEDLERMALSGVRTVVTCAHDPYPDMTAEVYSALFR
 RLLGVE
 TWRGEKAGLTVKVAVGVHPGGVPDNMSDVLREVEELLSHEDVVAIGETGL
 NENPD
 DREIQVLEAQLKLAREHEVPIIVHTPSRNKVEITEKVLILNSSGIDPSLV
 LDHASAET
 VSLIGEEGYAVGLTLRPGELDVWEACDIVEEYADEMTLIASSDLGSLAAD
 PLALPKLA
 30 LELERRNVEKSIIRDVVARNAERFYGL
- 35 <SEQ ID No.:0534;PRT;Methanopyrus kandleri>
 LRTNVYPRGCEDR LRFAALYSHQFGKRMVANLLNEPGHCRACGPVCDGCKY
 DMY
 SLVDSLVAVEELPKPEELPPFVDEPEDHLP
 ELPPVDVLVAIGLHPDLLVALSEVYEIK
 ALIVPVEEPDWIDPWIEEKLREVCEENSVELTVARPGCDLEPSGPVTEAFCD
 AGMIG
 RPKLFMKVEDGVVIDVHVRSAPCGCTWVAKRLVGVDADPEEVKATVSEAH
 HSY
 PCTASMEVDKHVGD TLLHVAGRLHIEAALRALEEATDTDA
- 40 <SEQ ID No.:0535;PRT;Methanopyrus kandleri>
 LHARCRCHTVKPTGANLRPLMKYIVAFRPGVDKRS LFRAVYLLDKAFERETGR
 PLT
 GTEYGHCMLLKAPYFSVDVKEAIFDLLRRGEIELRPERRNGELVSTYYPVGY
 RAEDI
 EDDVRREYSLHGDKWRLFREVLERVLGGA
- 45 <SEQ ID No.:0536;PRT;Methanopyrus kandleri>
 VEEKRSSCPYADEAVCELVEHAKELNEEIP
 EIETPHIRWPVQFPKCPYKQGVWCNI
 CSNGPCRITKTPRGVCGATADVIVARNFLRHVAAGAACYVHCLENAARALKSV
 AD
 EESPYEIADEKALRHAAEVYGLDTS
 GPKEDVAAEEIAEFILEDIYRPRYEESEVFKAVV
 PDWRIEMYEEMGLIPGGAKSEIH
 DALVKTSTNLNSDPVDMLLHVLRLGLITGPVALF
 GVETINDILFGSPKITQTEGGPGILD
 PDYVNIMTTGHQMALMKYLTDAAEKLEEEAKA
 50 AGAKGIRIIGATCVGDDFEARAEHL
 PDTYAGFAGNNFATEALAATGLVDAIVSEFNCT
 FPGLKFYKEKLDVELVAVDDVAKVWGAELILWD
 PERAAEEVAEEAVQRAIEAFKERR
 SKHEDKIMEPKHRHENVVGFYFSIEEAVGWENVL
 KLIEEGTIRGVCAIMGCTNLSS

GGHNVPARELAKEMIKRDVVLGAGCVNGAFANAGLFNPEAAELAGDNLQRVCEE
LGIPVVLHYGPCLAIGKIEHLVFEIAEILREKTGEEIDIPDVPASAPQWLEEQALADA
SSALALGITLHVSPVPPVTGSELVTKTLLEDLPDLTGSELIVETDMKRAGEILAEKIEE
KRKRLGI

5

<SEQ ID No.:0537;PRT;Methanopyrus kandleri>
MVVTMEIEAIRVATGAPGELYMVAEIAEDKVVNAEVCSTTPISWETLVLEKPVFEFA
VVAAERVCAASCDASLGLAVVEAAEAALNVEIPDEAERAREILNMANVVRAHATVLRAR
TDFLDVKKPAYDLVRAAKDIMHAVGGKPDHPPAVTVGGDLLEKLPVDRVESVAKDA
10 AEVADRLEDEVGSAVDRMKEDIDVEPEEMPAGLKVSDTYKGDIDPDKVETLMPDEF
YRMKTTLEIANNVVARYDGEPLVGPYARVRSANPLDLYTARAEVARMMLDGIAN
AVSRLDPTGNFRDVELGSGEGTAAVEAPEGLIVSLRLRAGRVDKALMLTPCNFK
VAAIGEMVRDLTVDRATVLRAGLSGRCLTH

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<SEQ ID No.:0538;PRT;Methanopyrus kandleri>
MKVAVLSLMACGTCARNLEEVCHEEGHEVVWSNLEGDEGEPPADILFVEGAVDFA
DAETLEKLEEAASAVSTVSLGSCAATGGFERHVIGMRDPDRYHFTVFPAKFVET
DYAINGCPPTTDVIASFLRALEENEDLRPYEVLSGDFHGLTPELSAPVTGPTVPV
EDVLLTSNKDLCGLCDLDVIEKDLFCVGCCTCAASCPAWAIEMDEKPVIRQERCVR
20 CGTCFVSCPRSFRI

20

<SEQ ID No.:0539;PRT;Methanopyrus kandleri>
VGEYREVYLTRATDERIREHGQDGGTTTALLAHLEEDTVEAVIASSTVETWKPEPV
IVTDPDELIETAGSKYAI SPNV SALNEAIASYDSVALVGTQITAVKKSKMYPYGLAN
25 VTERVKLTVGIFCTENFQYESLLKLLDMGVDVENVERMDISHGEFIVRTKNGDVHS
VSVSKLGDYANEACNYCTDFTAEDADISVGSVGAPDGWNVVLVRTKEGEKVFRSA
VDADVLEVKDIGEGDPNLLERLARDKKERIHTSMCATWRPYHPTVPL

25

<SEQ ID No.:0540;PRT;Methanopyrus kandleri>
VIKPRDFLRYFLYSYIVTSAQLLGDKAPTLLRMVCKNVVKALLREHPELKDAEPVELV
KDVAESFLGADVRIEEKSTETVVHVRGCKICPRDLIEEFTGENPDLEGPFVFSYNVCA
FVTMVEEILHALGHIDSDIKHDIKRGRCRVVIRPKGTD

30

<SEQ ID No.:0541;PRT;Methanopyrus kandleri>
LTVPTFLRKVTLREICVIEEYVDVQYRAIEALMDTLPSTDLVRLTVANALVSYQLSSS
GEDWWREFSSYFRERRPRDIVREYARFLPRSRGNRLIRQKLRLHRAKAFLEELS
WQDAKSYYRDMNRLRLDLARVLNADPESKTIVFTVKMFGYALRAITGRFRPYPFEIP
IPVDARIERITRRITNDPQLYWDSIARRTGIPPLHLDLSILWVGTSRDPEVKRLLAKVL
PKLIGELEMLGN

35

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<SEQ ID No.:0542;PRT;Methanopyrus kandleri>
MKLVIDVPKEIAKALDSKTRREILKLEERGSMTISDIARELNLSKSTVHHHLQELRKA
GLVDVIKEDRETPLPKRYGLVRRLVRVSKPKLEDASEYVIKALERGEDLRTSMFLAI
AAAYRAVLES LGIDASEVLYELGKEIGKRLAELGSEETVLRKGLEIIAESVEFRQEND
45 RVVVEIEGCHESDLPYGPACHLEAGIIAGVLSNLRERPYEVREVECCGEGADRCV
FVAEPATDEERPKS

45

<SEQ ID No.:0543;PRT;Methanopyrus kandleri>
LSRKPGEPAKEEDEKGLIAVKYAEEMLGDEYAEVVEELHRIIWKESPLDDKTKHLIAL
50 ALAAAAGDERRVGLIAETAKNVAEVTDEEIAATLALVAWVEGVSKVTRTWGVLRQ

50

<SEQ ID No.:0544;PRT;Methanopyrus kandleri>

VRLFIHADEMSFEARQKTKIAEEEEPIKEAEVEDCLVVFAAVQEADEENPKAIAEAA
VEEIEDVAGELKADRIVLYPYAHLADDLASPDVAVEVLKRMEGLLKERGYEVVRAPF
GWYKAFRLACKGHPLSELSRTVTPEAAAAEEEEKIESEFLVYMDGELIPVEEVDLSE
LPEDFRHLVMHELGEERETGDEEPAHVKLMREKEICDHEPAADVGHVRWYPKGVH
5 VRRCLA EYVENLMADLGA AVVETPVMYDLSEDAIREHADKFGERQYRIRAGNRALM
LRYAACFGAFRLADTTLSRRHLPLKIYELSQSFRLEQSGEVVGLKRLRAFTMPDLH
TVCADMDEAVEEFLEQAKLCLEVGLDLGLEYEYVFRTEKFLKERKEVLEELAEAME
KAYGDAKPVLVEVLPERKHYWECKVDFAFIDSLGRPIENPTVQIDVESGRRFGITYA
DESGDERHPVILHCSPTGSLERVICAILEGQYKRFEQEGLPTLPTWLSVPVQARVIP
10 VSEKVL EEA EKVFEE LKSEGFRVDLDDRDEPVG RKIRDAGEEWVPYVIVIGEEEVKK
GTL SVTIREESTLKEQRREEMTLEELVERLERETEGKPRVPLTIPDRLSRRPRFGR

<SEQ ID No.:0545;PRT;Methanopyrus kandleri>
LLVKG GCELSKRRVLSVLVKDRPGVMQRVSGLFRRRGFNIDSIAEGP SEREGLARM
15 TLTVKGNEQTIEQVVKQLNKLVDVIKVELDPERTVERQLALVKIRTKDRARAELAR
AAGAEVVDVGRETITVEIVGEPQDVESLLELMKDIGNIVEIARTGIVAMERET

<SEQ ID No.:0546;PRT;Methanopyrus kandleri>
LKKPVD AHC HLCFKYFKGEEDEVVERS RKKVLRVYDCGATPGTARRTLELAERFEG
20 FVFSTIGLHPPRAPRMQQSVIDDVRIIREHADRIA AIGEIGLDYHYVKEPGERRMR
EVFERFLKLAEELDKPVVIHARDAEEH ALEVLEDYDVVAMFHCYDGP AELARRIADA
GHYVSLSTIHVIRGPKDERTRELLETVPLEAALTETDSPYLSPV RGERNEPRNWVRV
IELLARVKGV PVGEVVETTARNALEFYDL

<SEQ ID No.:0547;PRT;Methanopyrus kandleri>
25 LRKTNLAALVSAVALLGALVLA FAGGPRWPVGV LALIVGGLDVMISFRRGGDRVLGL
MGFLLLMVGIAVLTGRVR

<SEQ ID No.:0548;PRT;Methanopyrus kandleri>
30 LKLCLVAFDGRIPMLSSIVDRFEEHVSEYLGEVKVKKKRAKLPEHAYSKVRGQYLAR
ALLDTLRGMKGEYDRVLGLTSEDLYAPGLNFVFGQARCPGREAVVSVARLLDPDPE
LYLERVVKELTHELGHTFGLGHCPDRNCVMSFSSSLLEVDRKSPNFCRRCTELLQR
NLKRGG

<SEQ ID No.:0549;PRT;Methanopyrus kandleri>
35 MYRITSKKLETRRLNGAVVTIEYVDKVGRRV VRRAKRSDIPEVVEIEERAFPKSPY
PTYVFLYNLSNNPEGFLVAEVGGKVVG YVIFELRPWLGE GHIVSIAVHPNYRRTGIG
TILMGEAERKIAEAGYETVRLEVRESNFPARRFYERLGYREERREHGYYSDGETAI
MVKKLKSPIQYRQ

<SEQ ID No.:0550;PRT;Methanopyrus kandleri>
40 VNAKGPLTRSTPSPVCGGTSRLWWREYVKEIQRKAETGEYAVRGFGTSRKVPHFD
DLVILPAQVSRPPIDKYREPCNTKTVLGDRFAEKPLKLDTPVLVGAMSGALSKEAK
VAIARGTAMVGTATNTGEGGMLPEEREEAKWLIAQYASGRFGVSAEYLN AADAIEIK
45 IGQGA KPGMGHLMGEKVTK EIAEIRGIPKGS DALSPARHMDIVGPEDLKM KIEQLR
EITDWKIPIIVKYSPGRVKEDVKIAAKAGADIIAIDGMQGGTGASPEIATENAGIPTIAAL
VQAVEALNEIGMRDEVDIIISGGIRDGADVAKALALGADAVYVCTSVLIAMGCTACAQ
CHSGRCPVGICTQDPELRKKLDVDEAAERVANYLKVVTEECKMLAQLAGKTDVHNL
EKEDLRALSEDVARITGVKMAGSDVELA

50 <SEQ ID No.:0551;PRT;Methanopyrus kandleri>

LILIIDNHGQYVHLIRKNFDYMGVPAEIIPNTTDPEDVRERASGVVISGGPSRERAGN
SREIIIEELTGEVPILGICLGHQLMAEVFGGKVDWAAGREEYARTEVEILDHEGIFEGL
PDKIVAWASHRDEVKEVPDEFVVTARSDRCEVEAMRHEELPLYGVQFHPCLKFTEY
GPDILKNFAKLCGEL

5

<SEQ ID No.:0552;PRT;Methanopyrus kandleri>

MWRTVKMGGSTTKFGFFTLVGYTALLLSLGAIVARLSEDRGLPDIPFLLLLGFLLGPI
AGIVRPEYAQKAFPFVGTGLIILLDGGFEIGIDVLRVASLVAKLDSITLLITAGISSLI
FNLVFGCLKPFSPIGFLYGSITCATDPATLIPVFSKVLPINISTALIAESVFNPLGVVLT
10 KMSLSVMGLSSHQNPILLFISLAAGGAALGLATGVVLERLLAREPFGEYVVPITLGAA
LALWYICEELLPGLLGYELSGFMAVAVLGMVYLGNNLIKHDYLDKDDRTFLKDFFEELS
TVVRIMVFTLLGACVSISLLKTFWLKGLVCALSNVFIARPAGVIIGTYIPPKEDLNLKER
IYLALEGPRGVVPAALVGTIYSKIVSNPHAVPVAIASEMPPKTLASAILVTTFLTIFISV
LEATWAQPLAKRLLKEE

15

<SEQ ID No.:0553;PRT;Methanopyrus kandleri>

LPVEKHVERAPKRLAIAVITVSTSKFEEAARGEEDTSGDILES RF EQAGHETRYR
VLIPDQREM VAGAVKWTANRVDVTTGGTGLTPTDVTIEAVGEIAEKQVPGFGEL
20 FRRKSEEDVGAHSILSRAEMFVVDGTPVACLPGSPNAVKLGAELLIEVLPHVVVHSR
GDV

<SEQ ID No.:0554;PRT;Methanopyrus kandleri>

VTAGGRMSMVDVTGKKEEIRIAEASGFLRLTEDGVNAVKSGESHPPQGKGDPIEVA
KVAAILAVKKTPELVPHCHPIKITGVDVDVEVLEDGVKMSVRVKSEGKTGVEMDALT
25 GLVVGLVTLWDMVKYAEKDEEGQYPHTRIENVRVVEKIIKEKE

<SEQ ID No.:0555;PRT;Methanopyrus kandleri>

MTFLTAGTRLVSLDYIAGFFDGEESVVVRFVRDGRYRAGYRVSTKVVFVQKERDVL
EEIHETLGMGHLYRRGSDGVWYLEIYRREDLREFVELIGNRTMVKRDALERLATVLE
30 LLEGGVHGSRDGLERIREVWEG

<SEQ ID No.:0556;PRT;Methanopyrus kandleri>

LTDRIETRIPGFDEMIGGGLPRRGVTVLAGLPGSARQPLLDNAVWNVLEDGFRVLLL
ATSTSPYEFLRRSEEDRRAREAYEKGDLLVNAFVSVRAGIYHRTVGEIIQDLEPHRI
35 RELVPEYDPPDVVIDSIYPMHRGEHEKFLQVISTLKVAVRNDLAVLAGCALPESAL
RSPNAEVADVLLLETAVHEFRGALVYSLLPIRTLPPHLPKYRAPVSILDDGTVVVHCDK
VLDVKAGEIRDVDEYLDVNLMPESMAREVAEDSEVLGELEEEERDDIEKLLEEELEEM
EG

40

<SEQ ID No.:0557;PRT;Methanopyrus kandleri>

LNTLERVLTFLQDLRSHLDGTGDMPEPRTLAEFALQRLTPMDLDICINIVETELVLWE
ESGLHVRPALHPYVSRIGVYTLDDDEEVGRFLGYPECCVEYFLEGHVRFDHDPDNV
VVTEGFVPCSPTCRRAHRVHLLFADPEPYRRLEGRRLRTRLEKLGVL SYHSAYR
45 GFYEVHVPKFEGVHLDRPY

45

<SEQ ID No.:0558;PRT;Methanopyrus kandleri>

LVRVRSVSRIHVTLIDLHGGLGRVDGSGVGTLEGPRIELEVEPTGEGVKVDGEGEIA
EKAERAARKVLDLYGIEGGVRIEVRRYPEHVGLSGTQATLSAAVGTLEAHGVEH
YDVRELADALGRGGTSGIGVAAFERRGGFIVDGGHVFGPGGKEEFKPSAASGEVPP
50 APVISRLEVPEDWRFVLAIVEVERGAHGDKEVNIFKRYCPVPAREVGEICRWILMVM
MPAVVEDDPEDFGRAVDALQDLGFKRVEVGLQHPVVREMMEVARSAGAYGAGLS
SFGPTVYAVCDSPSARDVAQELEMVMREEGIGGEVSVSEPRNEGFEVTG

<SEQ ID No.:0559;PRT;Methanopyrus kandleri>

5 LGVYVAENFTGVYAFDEEGLNIDHEPFPKDPDEIVERLLKRERGEVLEEEEEALLSRL
DADVINFEGTKADRERLEEVDGELVVEFPNVAGEVLRERARELAVEGVVDSEEE
YSELVYEVGMKLSKEKVRATVEERDQMIIQAINITDDIDRILNILTDRVREWYGIHFPEI
NKIVKKHDDFVTLVAELGHRKNFTYDNIKEVLPEFPDHLAEKLEEAAKDSMGAEMDE
KDLAAVQRIAEVARELYEIRRKTADYIDESMDDVAPNVKALVGPLIGARLIALAGGLK
10 EMAKLPASTIQLLGAEKALFRHLTKGTPPKHGVIFQHPLIHRSPWWQRGKIARALA
GKLAIAARIDAYSGEYRGDELRRQLEQRVKEIKEKYPKPPKRKRGRPPRGRRRPRR
RRSPRRSRRDRRRRRSRRRR

<SEQ ID No.:0560;PRT;Methanopyrus kandleri>

15 MVEIEIEPHEEFEGVYWAIFEDGRKKPATENLVPGHQVYGERLVEYDGKEYRWWE
RRSKLAAMIMNGMEYFPFEESKSVLYLGAAAGTTPSHVSDIIESGVEYCVFASR
MMQELIPVCEKRPNMIPILGDATKPHGYAPLVEQVDVIYQDIAQPKQAEVVADNAEA
FLRPGGYVIVAIAKARSIDVTKEPEEVFEDEERKLEERGFEVLEVIDLEPYERDHSV
EYHG

<SEQ ID No.:0561;PRT;Methanopyrus kandleri>

20 VNVLEVLVVVPSLYMGWTIGADDAGAAMGSAVGAGVRTMRQAVTLIAVFTTMGA
VLEGHKVVKTLGKGVVQAHLDPAAAGATVLVAAAWYHLAVMLGVPVSTTQATVGS
AGVGCALGLPVNWSKFGQIAVGWFLSPILAMIPAYFVSRRRLRAVLEKKGWPLAEIER
KIGWLLTISGCYVAYTIGANNAANAVAPIVMTGLLDVRSAAIVGGIMIAVGALTAGSKV
IETVGRKITRLDPVTAFAELSAIVTHGASELGIPISINETTAGAVIGVGLSRGELNTH
25 TLKKIFTTWIASPVGSFVMSYALMRLYLSVRGAAPV

<SEQ ID No.:0562;PRT;Methanopyrus kandleri>

30 LILRPSTRPAERALDALLEELDTMIEACDLLSDVTTMEESPKEVEERQESLSEEVAEL
KDRVDEAMESSSMIPVVKEELGYIAENVRRAAETLLSLASLLVSFYEDLEEDREKL
DEVIEGIAKIASGVRESVELLNEVDVRKAAEHVEKIRDQEEDVRSRLRTLMLKTERN
RLAPIVLEIERALEDMDRALDGVNRIKVRFLG

<SEQ ID No.:0563;PRT;Methanopyrus kandleri>

35 VRPVEVLGKRWAHPIACASGALAAHRPGMENAVLRGAAAIFTKTVTESPREGHPGP
VFVDYLDEGYALNAMGLPNPGPDRMVVEIEEFRDEFDVPVYASVAADGPEGFKRL
ARAFSGVADGLELNVSCPHAGKGYGAELGSDPEAVAEITEAAVRAFDGPVSVKLTP
NVDRETLLEVAAAAIDAGAEALTAVNTLGPGLRIDLRTASPVLGAGVGGLSGPALKPI
ALRVVADLALEFGEEVEIIGVGGIRNGEDVVEFLFAGAKAVQVATAAREKDFGDIAM
ETSHILKELGYDGPPEEAIGAALPEYRERLRRLGWCQ
40

<SEQ ID No.:0564;PRT;Methanopyrus kandleri>

VVSVKPIPAEVVENREECERTIVLRRLRPERPIRWEPGQFLMLGISGVDEKPMASFSG
DDREFELTIEIVGPFTERCADLEPGDVVWVRGPYKPFVVRGSRVAVVAGGTGVAP
LVPLVERLRRARVHVTSLVGGPHADRLPRKDDLEKLSDELYVTTEDEGSEGRKGFPT
45 DVLEELVEKECPDVVYACGPEGMLVRVAEIAREHDVPCQVSVVRYVKCGEGICGS
CALGKGLLVCRDGPVFWTEEELEGTEFGGVRRDVTGKPE

<SEQ ID No.:0565;PRT;Methanopyrus kandleri>

50 VTSRESLSDVAFVLPANHNEEGAVGKVREIRRMYPDALIIVVDNASSDRTAEEAEKA
GALVVREPVKGLGKAIKAGIQCALEHGARIILRTDSDGEFDPNCFALIEAADDYDLVI
GNRFSEGRPENVPPLSHYLFNMILITLFWLFYKILDVTCGCRVFSRELAREILKRDVD

DGPAFDADTTSLAVSLGYSVKSVDVRLRGRISGQRKVAPTVIGKVLVGLRILFRVAV
NRLRWRCEPSTLSRGQ

<SEQ ID No.:0566;PRT;Methanopyrus kandleri>
5 LGLAELRELIEPEETDLRALAGREIAIDAFNALYQFLTITMKDGRPLMDSRGRITSHLN
GLLYRTVNLVEEGIKPVYVFDGEPPDLKRETLERRRERKEEAMEKLRRAKTKEERE
KYARQVARLDESLEDKRLDLGIPWVQAPSEGEAQCAVMARCGDVWATGSQ
DYDSLLFGSPRLVRNITIVGKRKHPHTGEIIEVKPEIMRLEDVLDQLGLESREQLVDL
10 AILLGTDYNPDGVPGIGPKRALQLIRKYGSLDELKDTDIWPKIERHLPVEPEKLRRFL
EPEVTDDYELDWDEPDEEGLVEFLVEERDFSEDRVRRRAVERLKEALQELRKGGGRQ
ETLDAFF

<SEQ ID No.:0567;PRT;Methanopyrus kandleri>
15 LIAEVAEFVLEALLVIGVSVFGLHLLGALASEKIRCRAVPLVVVGLIHPHAALTAREM
GLKGRELLIAKVSFNSATYTATACVNALTLLGSTVGGPYALTALVDATEIVGGLLL
RRVRAQLPTHGSLRDALNEATRTVGRIAYLVPGALLGIISSYLRLGGYVPMFTL
ANPVAGCAAVGTMLRSGVLDYAHAYSLAVTGAALAYVGRLLRSCGPVTVAITGLRS
GSLLSTVNLLADIGLLLVMVIGYLTFGPPGVPPLGVLGGF

<SEQ ID No.:0568;PRT;Methanopyrus kandleri>
20 LGSLETEPVSLSLKRPFRISGREVRRVRGYWCTCVIEGNSGRGFGLRRGIAEEMAT
LDAVARRYDEPLCRVWGREPASIESFATVDLVGAEEQAELARRYLRGYRKLKVKV
GGDDLKRDLERVEACVKSAEFDALILDGNEGLTVEEVFRLLDFDGDVYLEHPTP
PDSLEEVCESEAPVIVDVM DLGARSIDVDVAEPCDIVNIKTQEVGFVGGRLRLAR
25 DAREEGFKVMVGCIVESFSSISAAAHAAVEADLCDLGDHFLDEDVVSNGPYAP
VMVTEGPGWEVRVERPKPA

<SEQ ID No.:0569;PRT;Methanopyrus kandleri>
30 LELPHKPGTPAILCHGAFDEPHGKTAHGLLRFGRIYDIVAVIDRELAGKTAQDVDPD
FPPVPILRSVSEALEELDPEVLLIGAAPPGGKLTPEWKEEIIEAVQAGLDVVSGLHEF
LSKDPDISEAAEESGSRIDVRKPRKELFRVADGSARDVDATVVLTAGTDCAVGKM
SAAIELVERLREEGVAAFLATGQTSIMIGAEDGVVDRMPGDFMAGAIEELVRLA
EDHEIVVVEGQGALSHPAYSGVTLAILHGAWPDVAVLVHDPVREV RDGFPRFRVPD
35 PRTEVTLIESLSAAEIVSVLRTWDERLAEKLSSEGYLVERLGDRLRRTVDRVLEIHRM
GR

<SEQ ID No.:0570;PRT;Methanopyrus kandleri>
MRIRPDSTAEDILPLAMAVHELVNRLPVTMRTRDNPGVRIEDGEVIDDEYTGPVLEE
40 VLEKGEVIRKVPESGPYEGTPVWVPIKDEGETIAALGVVDLTGYIYSSLRKVTQRPI
R

<SEQ ID No.:0571;PRT;Methanopyrus kandleri>
LKPCKYRCPSPGDTCDRCLADGDQMERTVESYRRDELFRSASEIEVEGYMEWT
RVEEIAELCERMVWKS VGVAFCVGLAEEARALCEFLEGRGLEVYSVCKVGGVPK
45 SKLSLLELKP GDKVCNPR LQARLLNEIGTDLNVLVGLCVGHDIIFIEESEAPVTVAVVK
DRRLAHC PALALTNRYYRRKLGLE

<SEQ ID No.:0572;PRT;Methanopyrus kandleri>
LAKKLCFFLGCIMP NRYPGIEKATRLVFEELGYELVDMDGASCCPAPGVFGSFDLKT
50 WVTIAARNLSIAEEKGYDILTV CNGCFGSLNEANHLLQENPELREFVNEKLAEIDREY
KGKVKVYHVNTFLYEEVG VKKIKEKVERPLEKTDGEPLKVAHVHYGCHLLKPSEVTGF
PGSVEDPRTLDELVEALGAESVDYKDKIMCCGAGGGVRSRELKVSLHFTREKIFNM

LEAGADCTTNVCPFCHLQFDRGQIEMKEHFEKLPPKKLPVFHYCQLAGLAFGMDPE
ELALETHEIDCTPVLEKLGLA

<SEQ ID No.:0573;PRT;Methanopyrus kandleri>

5 LVEPRDTVIREEDLNPDFLEELSELVEPVFEEEEVLSVQACYQCGTCTGSCPSGRR
TSYRTRLIMRKLQLGLVDEVIKSDELWMCTTCYTCYERCPRGVKIVDAVKAARNLAA
KKGYMAKAHRMVAMFVIKTGHAVPINDEIREVRKNIGLDEVPTTHRYEEALEEVQK
LVKINEFDKLGIDWEEGDLVD

<SEQ ID No.:0574;PRT;Methanopyrus kandleri>

10 VRDVDVAIRVNGVLLTPEELELLKLSEHGSMKVAEEKGVTRSAVHKRIRNLEER
LGCRLEVSSPLGSYLTEHGRRIVIKYVNAKARLSRTETTVACSETVIEDVLAALGREH
DVDVIVPPHEKMRRVEADVVPDDPVIVFDRSDEAVGEPVVRRLVVRVGDGSG
FVEVPGSAQRIYLTDLRNREEIRPKMRVSYASALEAVRDGGMWTVVPEELAPEGD
15 DPGPHYTMALPLTRDGEDLLDVLEG

<SEQ ID No.:0575;PRT;Methanopyrus kandleri>

20 MPICVEEPERIREAAESLMETLDDLVPVAMKLYLSEGDVPDDYERVGEECRHCEF
VMTVARGEMDNİYATPEEQACKGGSAAIGLDDIPDPVRTGKFYYEGLGQHATLSAS
KRTVELVPKAFDGEVFEAITYEKATGVEVVPDVLVCKPKEAMKIAQAYLYPEGG
RVYSDFSGIQSLCGDGVGKIMKEGGINFTLGNGSRAYAKVPDECLIVAMSTKAFVV
VGHSVTEIP

<SEQ ID No.:0576;PRT;Methanopyrus kandleri>

25 LRPFLRPVVELVQGTAE LRPERVLSCVFGIKEDEAE LYKLLENSEEAPFTVEDVAEI
INRSRSTAQKMLQSLVRVGMVERERETLPGGGRRYLYRPAPWEKV KELGLENLRIV
CEEIERWFREFTPH

<SEQ ID No.:0577;PRT;Methanopyrus kandleri>

30 MSEERRPFAEKVETRDGEILLRCPRCDALFRDQKSYSRHVNKSHLYKKNRPKRIL
KKMKRRGDVLVQD

<SEQ ID No.:0578;PRT;Methanopyrus kandleri>

35 VGKRVLAGGVFDILHPGHVAFLEEARKIAGKNGELVWVARDET VRRLKRTPIVPEE
QRVRMVSA LKPVDRAILGHPRDFSITLKTVPDVVLGPDQDIDEKEVERWAERAG
VDCEVRRIEKYERCPLDSTIKIVKRVIELWKRGE LRV

<SEQ ID No.:0579;PRT;Methanopyrus kandleri>

40 VLVLARVFIHPPNSLILHDLVERFGHEPLSLPKEISKVRVDPEIDSPPMNVTPQDAKR
GLKYAAVEVPSGVRGRLALIGPLIEKADAAIVVTGIEDFSFGCLGCDRTNEFV TYLVR
RQGIPVLELEYPKSEEEAKAFVREIRDFLES L

<SEQ ID No.:0580;PRT;Methanopyrus kandleri>

45 LAVQIAQLSCGTEYSGVQPEIERAAERVGA EIVLPEVDIDIVEEACEEVGYTPKSANL
KVLLARAYALANGYAEADAAIILTCFRCAEGALVRSEARRY LQENTDLPVVTYSFTE
DLDASELLTRMEALVTIVERKGLLARKRQEGTLTGIDSGSTTTKAVVMEDDEVIGTG
WVRTTKVVESAEKAVERALEEAGYELDDIEAIGVTGYGRYTLGRHFDADLVQEELT
VNSKGT VYLGDKQEGGATVIDVGGMDNKAITVWDGIPDNFTMGGVCAGASGRFLE
VAADRIGVDLDKFGKLALEGDPEAVRLDSY CIVFGIQDLVTALAEGADPEDAAAAAC
50 RSVAEQIYEQLQEI D IREP VFFVGGTSLVDGMVKALEDVIGVEVVVPEYPQYIGAV
GAALLASNYV

- <SEQ ID No.:0581;PRT;Methanopyrus kandleri>
VYEHKGKRLVLRASEKEAAELYDITRHAATDLGLARTITAAVFHLDIEAPLYAAAVRT
RPMLRPVTLGKVSHLELDDEEGTLKVSVAVERYFPDVIRTLQSVFGEDRVRHEERL
EITIEPPEGMSPEHLEKLEELVHDPKKLAHRVYDFIERVRPEGFRVARYARFDQD
5 FLYLASEGTLEDEWTDLLFELPGELDRVGERRGPSE
- <SEQ ID No.:0582;PRT;Methanopyrus kandleri>
VRGPCPNDHPCYVGEHGKFVKVHLPVGGRCNIHCRFCESGLEHEGVRVDYPGRA
VRTITGDEARTALKRVKEHCGRVDVVGIAGPGDPLANWEDVKETFDVVAETVPEAK
10 RCLSTNGVWLPDLIDEVTELVHSVTITVNALDPEIAADIYDRALTPEGEVLTGKEAAR
WIVERQEGAMDALKKERYILKKVNFVLVPGVNEDEVERVAERAADAGFHAMNVIPLI
PGGDMKDHPPPTCRELSRARDRAEKYITVMRRCMQCRADVIHCRGRPRIWELLE
ED
- <SEQ ID No.:0583;PRT;Methanopyrus kandleri>
LGVASVFETVIYEGGVYKADEMRLVEDLGGFVLSEHQMQLEVHMLAVPVDDLD
VIERKAEELLGEIRRMPLAGTEIAVVGMSLARHHMPHPVCDIAEYLRRHGAKSNVIG
LARGYGRELAQLRTREKRLL EEHDLVIFVVGNFKDCIEKYKLPLVRRRIERPVVVVG
GPEEIDADDVVYVGGIGRKPYPFRKGREITKLDEIVDVVSKIIIEERRQELAEDPPVVP
20 PMVVKDRINRELKIEERFTSPMPITLQLDGLRVKAPYDEWADRVAEVEVFGWKLREI
ADIRSEMDDHILVKIRPKSAVTG
- <SEQ ID No.:0584;PRT;Methanopyrus kandleri>
MNVRPGGPPVLDPVRLGVPMEVPEDPVELVRVFRVLVETLERGTL PFLGASYRSV
25 NGKVYGPYYEARWKPRKGERGRTIYLGREDNESVQFLREWLETIRLAAPRLSEHR
KAKWFVARAVRRALVPVLRQLAQMSAEHRAEVLQKLEEVKEGVSRTCSILRSVEF
NPLRRLGWPGSGKEIIDSVLRLPGTVRDILVDVLAPWPAWYSLRIVRLWRGEREA
RRYWRERVGLYDRV KQREAA
- <SEQ ID No.:0585;PRT;Methanopyrus kandleri>
MSRGTKAGIYRDVLVIEVFP GAVPDTGTLRALNERERRLLAAAGYDVTEFWARSFI
GLLFDHPTPLVRASERHEKLLPEATVAAVRELCDRIEPEKLRKIRSRVASGETPREA
VRRVLGSKMAGAVSRLGRVMGYVQSDPLSVAITLQVLGTMIADKRLEDVSTVLV
VVPGLEHVHIDVYRLARRVYSNLVRAMKSLRRYLNPVRVRVRYVATGGKLEHPAGD
35 SPEEELIEAYEELSRRPTVRRFFPERGHFTEVPWDRALAEFFVRVIRRELHRRSLKV
VRAAKREGASGRELSEVYGREYKWL SRWFKRGRRWLN FHRPSPALSDISCCFV
ASEAGVEGYHEEFLIKVLQKVLREVVERVTGRRLVRKIVRKIARVLKEDFRVEGKIR
EGILHMARLLGGRRKAALGGKTLLEAFGAPPPS
- <SEQ ID No.:0586;PRT;Methanopyrus kandleri>
LDFYSPTFHSRECETAGARKMDVKTLVGEYYASLP SGVLREFVEDPSSREWAYTFL
KGRDIVFTRKRRLEDEVSGFLELYHSTGKFKNPKSWEGLLGWDLVIDVDAELPEEPE
AFLKSLGRLLKDVVIACDELRRALGFPRPDVNFSGSKGFHVRYFDSTVRRWLRWD
LHERRGIKPGEIIQRVGRGVVWLAREGFVAGDRVRALREGLLDDSMYDLKRLRCV
45 GSMNVKSLLPAVPVWSREGGRWVDFRDEV LGMNDLELGCLVAHRTLTPGRGGGL
GVVLSRVLDLDTADPEDPSDFVEVWGNVMSVLGELKP
- <SEQ ID No.:0587;PRT;Methanopyrus kandleri>
VRFVVPFADRGDRKTRLSSCMDEETRERFALAMLRHVVRVLSKFGEVEVVTDPDSSL
50 SVPGTKVRRSDASLDELPLPDGEFGLVMSDLP LLSEEDVERALEGLKDADVLCPS
RRGGTSGVFVRKGVFRFRPTFGGVSFPRNLRRAEKQGVEVAVVKS LGFFADVDEPE
DLLDAALLGRREVAKIARSVVEV

<SEQ ID No.:0588;PRT;Methanopyrus kandleri>

LLSREEILEILSEYDLEDLSIATLGSH TALHILKGAKEEGLRSVVVCEEGRTPYERLG
VADEIIVVERFQDMLDEEVQERLRELNAIVPHGSFVAYVGLDGIENEFCVPMFGNR
5 RLLRWESERSLERKLLKRAGVKVPKVFDSPEIDRPVIVKFPGARGGRGYFICSDPE
EFEEKAERLIEDGVIDEEDLEQAHIEEYVVGTFNFCVHYFRSVVEDTVEVLGMDRRYE
TNIDGLVRMPAGDQLEAGLEPSYVISGNIPVVVRESLLVQLYEMGDRVVRASEDIEE
PGFIGFPCLQTLCTEDLEFYVFELSARIDGGTNVTFLPYAYLKFGEIVTMGRRIAKEY
REARDKGLLEGVVT

<SEQ ID No.:0589;PRT;Methanopyrus kandleri>

MLLIVAGHDPTGAGLRADIATAEALGVPVSLPTLLSLQDEGVELVEPVDSRFLSDC
LARYVPRCEVVKVGAVPTLKTFEILAKRLRDLTVVWDPVFRAEAGGELSEATPEEAL
ETFGETVDILTPTNEELSQLVGREVRTTVEAELAARELVEEYGLTGVLVTGGHSVDR
15 RDVWVPAEGNTIAWEVPPGEGAHGSGCVLSTALACFLVRGLDPETAVERAVERFAR
AAVREARNTPFGRVADPVAQIRRDATLGKATQHVIRALEIIESDPAFARAIPQVGMN
VAEVFDPSPRGLEGVVGLSGRIVLDGDRPTAVGRPVPGGSKHVGTVALT AHRLDPS
VRAAVNARYDEELIERARDLGFWSSFDRSEEPVEVDSTM EWGTEVAFRRADDT
DVVYDEGDVGKEPMIRVLGKSAVEAVTKLRMLLGCVVGV

<SEQ ID No.:0590;PRT;Methanopyrus kandleri>

VSSFKRLLYLDVISRSHADFAKRVIRRLPEPKVKVRVECLSKYEREDDALTYDGRDKD
EEPWKEFLRRLGRESSDTVVATALNVPPDVPDISPNPTVVIGVNTGDHPKTLEVAGL
ADV VVVGRRLYSPSTGPREFGRVRSGLRNGTVIVDVEDLGLRYASKAVPVIAVLV
25 AENGVDGLIRD LRNRVRTLT EEVLRDLSLSQV

<SEQ ID No.:0591;PRT;Methanopyrus kandleri>

VSKAQILVVLAMLSVGLQSVSAAPIEGQFVEENDYQWSVQVTHCEPTIDMTKYPVIV
GEKAVYLVLLDERDVQKGGGLCDYQPALMPVPKDYVEISGNKLSFKVNLEGQKLPF
30 YCMYLGVDFFDKLVMVTIEELAKHSVRYDWGYISEPKPLTSLFLRKIVEAFESQVDN
PFPHSAFKNEAVWNAVRDTPYIISGPVHVSAVDYGT DYVELEIEIPVRTDVTELTGTI
EVKSGESTQTL SVTGSDVVNGVIKKREYRRPRIPWK

<SEQ ID No.:0592;PRT;Methanopyrus kandleri>

VEVTIQLSGVVEGQQVTDVYPVTITVQLVKNSSVNITVEKITESEAVLRVDYQINTEN
35 CSVKSVEVKLLKDGNNVASEERSQAEGTVRFTVNESGTYRVVIEATVEWTTTPSGRH
EEKLT LASEDVEVTLSRLEV GAPS VKVSDY GADWATLEITVPVTAVGCEVTGGKVE
VIEAGTGHTLATTEATVDNGVLKATVKLTGLRSARIPVIRVTAEGKTPTGDSVTATAE
ASVEVRLASAE LGGSVRVESPRP

<SEQ ID No.:0593;PRT;Methanopyrus kandleri>

VCYEIHTQNCTVESVTVELLKRTDQGWVVDRRTLSATSDVVTFRVSEEGQYKVR I
TAQCTHGVMTAETEPVTVQFLPKVEISGFKVVETDYGPDWVELRITADVHVERAE
45 KVSGLVVEDAKGNVLGKFPVEISDHMDVKVRLEGLE NVS

<SEQ ID No.:0594;PRT;Methanopyrus kandleri>

VDSVVL SKVKRIVEVRGDQLVIETQTGERCILKVD ERGELRPVKFLVIKSGSYEVS V
AGSAKAKAKARATPLILIPILLRLVRRSTA

<SEQ ID No.:0595;PRT;Methanopyrus kandleri>

LRRYRIRPTDFVAVVSHFEARELLRAVRKGG EIEIQLDLGLHSGKARINGDTVVIEGV
50 ELTRDELESMTGWKGAYGLTTDNVYRIEIRAEHYKLLPVRPGEAPTIEIDGIRMHRT

KWTDPWTDAGVKVGKVGSEGDRLDVCTGLGYTALRAVERGAEVISVEKDRNVL
EIAGANPWSRGLLEEVEILLGPAEEVPSLDDEFDAIVHDPRLARAGELYSENFYRE
LLRLLRPGGRLVHYVGAPGSRYRGKDVLAGVSRRLTRVGFVVDVDRRWGLVTAE
KPSARV

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<SEQ ID No.:0596;PRT;Methanopyrus kandleri>
VLPDHGSYALVFRVNRVKVNVGSLGDVIVEAGSWTYVSGSMGQGSSGLRGRGLG
RHLKSAREGTERPHWHIDHLLSQVRPEVEGAWIMEGDRECELAALADMVPGIRG
FGCSDCHCETHLFRAGIAETAEAARRVGGGTFLPTPTLERWVSQL

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<SEQ ID No.:0597;PRT;Methanopyrus kandleri>
LFGDSRLVLALLVILVGATIANAGNLMYPLLSRDSRAHVLKIWYTYHMLADGRWDPW
CPMWYSGFPYLTYYGSLGYLLGAAVDAIVKDPVRTFVCLIVASALIGVGVYALVRA
RGYARKVAVICALLGLTSGGFMKALNWEVGYPTILSLGFGFLALSCYERWLRGEKR
15 HLAYATLLLVPACYSHPLGGLLGGILTRGIAEAVLREKLRTPRFLLQSTAPVAIGIAI
AFSHYAAAIYYKRFLSELWLYPGGSVAGVLKDLTVGGKWSTGLLVTVTGIVGVAYEI
RRRTGFGFLVLFWGMVSIVTFAFVLGYWKYLPGLKNMLAERYTTVLMPMLLAVTA
APVVRQLLRSVKAAWAAPLGVAGLLLSGSVGALTYVPPEPPHVTSSAMKLWKWMG
DSWPDDSYTARCDADPYTHLFDASVPISPIYSGHPTIMGWFSQGDPMFFSLAARW
20 EWELGWVYDPNTLKTSLWATNTRYLLTKSSLLSKKLSQEPGFVLRKKAGDYRVFEF
LGHGGSACVPHPIAVVDRRLGLRTENAYTTLLNFVATPGNRYVFDATFCDAK
FDRVIVRPLTPGDVDRAVKLAREGRKVLILPVSDTRVARAVERLGV RVSPASPPSF
VPLRKYLPSAYRVDGRWWKDV RVGHGLVRVCGVDVYFTMRFHRLIKEVQTEGY
RMPRLPTDEERKFVNGVLRGFD SGKPTQVHLEYRGDPAVMRVCGNGWVYLKVKY
25 FPAWRSSDGPVYPASCGQMLVRAHGDTVLR YELPQSLSYGSYAAAVLGTALGAM
LLWM

<SEQ ID No.:0598;PRT;Methanopyrus kandleri>
MDVIRAILVTALLYGVGWTSTVNVNWTIPHEMVRMSAGIYQSTGATTQLTLNPLYRGR
30 ATLA VAYDPAVLVKLGDRGKPVRLSPSSLRVGRV/KVKS YGDAVVIHGPCSVRPYISA
HGV RYSFDIIDTPGFSVYFNRS GYLVLVSHGKTTKIRVLPLIPLI

<SEQ ID No.:0599;PRT;Methanopyrus kandleri>
VPELPYVAVPKHMAERARRVLSREDLLAKDV KARR EEDMVLFPVRDAGRAGSVLE
35 ELGIPYEAGEAEFERTVEHRSVEEVLEDSFGWSVPVPYDVIGDVA VQIPDELRGH
EREVGRAIMKVHRRVRVAFERGPVRGVFRVRDLRRIAGKGPAVTEHREHRCRFRV
DLARCYFNPRLATERLLAEDVVEEGSTVLDL FAGVGPITVILKRFVPSVEVTACELN
PVAYRYLLENLRLNRVEARAFLGDAREVSRLVGRFDYVIMNVPKMAHRFVETAVRC
VRPEGRLIYYRIAPNAEEAFEELRRKADRPVELESHREVKPYSPEESLYRLVVRVH

<SEQ ID No.:0600;PRT;Methanopyrus kandleri>
VIPVTVVYHNVHSPRKVEEMARTVAGFGAKRFVISRALGSAAQEGVPKAQRICLEA
GVELLFFQDLEEALKALSPDVTYMAEDA EHGGA KPLDFDAVVEEIEQEREVCVFG
SARPG LTKQELELGDEAVYVGTERNVGEVGAVAILLHELKRLNQ

<SEQ ID No.:0601;PRT;Methanopyrus kandleri>
VKKVVALGIVIVAVLGGALGYYYTTSNVVRIGYQPSDHSAALFVAMAKKMF EKEGI
KVETYEYFKAGPPETQALAAGKIDVAYIGCVPAITAYS KGVPIKIVAGVNQEGSAIVVR
KDEAGKIKDIKDLKGKRV AELMKGSIQDCMLRTALKRAGLDPDKDVIDEMKTADAV
50 NALGAKQIDAFIEPEPGPTMAVKKGFGVRLMDTGKIWSHHQCCVLV MRKDFIERHP
NLA KKV LKVHVMATKYVQEHPDEAAKITAKQLKVPEEVEKEAMRHVRYSDLDVDS
IKMFARFLKQLGYIKELPDWSDFIDLKLLKEVAG

<SEQ ID No.:0602;PRT;Methanopyrus kandleri>

5 VIRNGDERLETLLKVSAPVAVLAIWQAVSGLGLINPVLLPPPSQVFSVFVEMPGEILK
HALTSLYRVAVGYISIAAVAGVSLGVLMTYRTAHAAMDLLIEIRPIPIAWIPLAIVWF
GIGDPSAFFIIFVGSFFPILINTISGIRSVDRIVVEAALNLGADDTALIRHVLVPGALPNIF
TGLRVGLGVGWMCVVAAEMIAAKSGLGYMIEAQRLATDQVIAGMITIGLLGLVMDR
GFRYLERRALVWR

<SEQ ID No.:0603;PRT;Methanopyrus kandleri>

10 MAVILKVEDLHKSYYDDLKVLDTGTFEVSEGEFFAIVGPSGCGKTTLLKIIAGLEDYDAG
RVLVDGEEVREPGPDRLVVFQEYAIFFPWKTVLENVMFAPLMQGGKDPEEAERIAEC
LKVVPGLGEGFEDAYPKQLSGGMKQRVAIARALAAEPRIILLMDEPFAAVDAQTRNKM
QEELLKIWERTGQTILLVTHNVEEAVFLADRVMLSPRPAEIVDIVEIDLPRPRDRTD
PEFVELRARILDMIGSR

<SEQ ID No.:0604;PRT;Methanopyrus kandleri>

15 MSGHTGPELAPELERHGVGMVILGGYPGDDATYRASKLVARRRDEFVPPDRLPE
ELSRVDVEIPVAVNVRFADPREAGELSGELADLVVVEINAHCRQPEIVRAGAGEAL
LEDRTRLIEIVEAVAEHDVYVSVKLRGPHPAFEDALEALRDSSVDVLHVDAMKPGEP
20 TYELEYVRAAARVGVPVIGNNSVRTPEDVDRMFEGASAVSVGRPILEGDWDVLER
LVRYTVLRKSSEAGLART

<SEQ ID No.:0605;PRT;Methanopyrus kandleri>

25 VPLRSDYRYRSITLKIVGPEGYRRDLIFLSDRCTAVYNELNYLRRRFFFKGLDAVAV
SRSELTFRRIYREYGPILGTQTVAIGEKNTEAWRSYFKQIKEVKSNKRRTICQPPRY
WKGPLGREPRFVFLASQIRRFEDPLEHRGVIEILGLGDVVDNLPNVGFKRGRGRG
VRLEFVGWFPWHPNRVKEPKRADKIILNGDDGKEFFGRSEIVYSWADNAHYLTLM
KVNKGESWLVSRLTPNGRVRPIPTGNNCENAAVDIGRRIFAAYVFSKGKPVLV
RWGDAWSRWWSYWRKIKAPKEQRRNLKNGANFSLKQYYVKAHRAIMDAIRHLVS
30 KLVQILLSREVTLVIEDLKGLRQKLHGELAYWAYKRIIREIKRKCEEYGIEVIEASPAY
TSVTCPMCRSKCKRNGGLVICSKCGKTMNADIVRAYNLLTRATDDPPEPELEYLTG
SNCTTVLPSNHKPPITPNR

<SEQ ID No.:0606;PRT;Methanopyrus kandleri>

35 LVSVLRTLLRIPAVRRSLVVLSSILLTSTVIFHFLEGWPLLTCLYFTAATITTVGYGDVV
PTTEAGRLLSVIVMFSGIGVASYALGDIQLVFRGELSLAIKEDVLRKRIKEVENHIIVC
GFGRTGSRVARLLSERYKFDVVVDKDEEAYERAVYQGFPVAVLGATREDTLQEA
NVESARGMVVATGDDRTNVFVTLLAKNFRRDLHVAVANSREGAKMMERAGADE
VLFLYDCASRHIVRAALSPTMFRVTVRHSVDEISDVMWIIIGNGGVVQCVEYYTPPLK
40 SPIRRDVVISSMDEVMRVKSLEKYPERKRTLEDLYRVSENVHTYYVIVHNEEERER
ILRELDRRGYLVGVDLTIDEILQEIERLRGE

<SEQ ID No.:0607;PRT;Methanopyrus kandleri>

45 LSSGFKRPSPTWRPKKEEELIELIVEACPTEGPRVKAGDDDDAAVLDPDGTVVNFDA
MTRSRHVPKELRDRDLGWKFVASVSDVGAMGGEPSFFGFSVCLDDEVDEQLV
LGISEGLREFGVSLIGGDVVEGEELVLSGTCLGKLKGEPLMSNARPGDVAVTGPL
GGPNAFVRAILNGMEPEETLYERFARPRPPVEVGVELARGGYRAAVTDISDGLLAE
AEAIAARRSGVAIEIHTWKVPVDEGVVEEVAQEFDVPVDLALEGGEDYEFLICGPEDV
VKEFGLTTIGRVTEGEGVRIVRNPRARSE

50 <SEQ ID No.:0608;PRT;Methanopyrus kandleri>

LKPELKRVPREELESIANEMARKFNCERVASVVRSFHLIKLEGRWTEYFVVRVDFD
PADLPERADPFLVGRPF CERSARGDLRIHVEGARELARRVDEIKTYVTERAAVLFTY
GRDVLPE SIVEIRGPKEPRLVAVVYRDDLGECVGVGRLRFSEDGRPVVDNVIDRG
WYLRRGG

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<SEQ ID No.:0609;PRT;Methanopyrus kandleri>
MLAISMDVENVP GALKAIAGVIADHGGNIVHIQQDSEGELARLYMEIEGVERPKVLVS
ELRSLDVVREVRVLRPLKEIYGKRVIVMGGGAQVAEVARGAITEADRHNI RGERISV
DTIPLVGEENLAEAVRAVARLPRVGILVLAGSLMGGKIAEAVQELREEHGIPVISLNM
AGSVPEVADLVVTD PVQAGVMAVMAISDAGVFDLSRVGRKF

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<SEQ ID No.:0610;PRT;Methanopyrus kandleri>
MLLEKSLEEAPVVRNGYWYFIHPITDGVPELPPPELLREVAYRIVRALDSTDFDKIVC
VEAMGIHLGALLSDMLDRPLVIVRKREYGLDGEVEITQEKG YGVEKLYLNGVSEG D
RVVVVDDVISTGGTLVGLINALDDVGAEIEDVVVVVARGGLDRVREETGVDVKYLVR
VEVSEDGVS VVESRYR

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<SEQ ID No.:0611;PRT;Methanopyrus kandleri>
LYPMLRDFLVTEDAVFSVISYVHPEDGFLALMRYVKDPEGDRIRRP TGERYRKVSFE
ESFEILRERHPEYVRKVRGDFYDQVPPEDVVEHLHPRDRMERILEEPRDDLEEMA
ARAVLELAEDSGVPESRFGVTGSLLPELHDPAESDLDLVYGVQEF LAVRDAILRIQ
ETGEGRDLLRALDYDQWERVYRRRSPELDFEEFLRHELKGNRVVIGDRVCDVLL
VRDESELS DVRWEEFETVEENVRLVCEVLDDSLAFDYPARWRVEAVESDTEEGYE
VTEVRSYTHTYVGQAFEGEVIEVSGKLERERN SGEIAIVGSSREAEGEWIRVLKDQ
R

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<SEQ ID No.:0612;PRT;Methanopyrus kandleri>
LIEERVEGAELRVVRLEPGERFPESVDTSRWRNSVVVSGKGSVRALRWRLGDTPV
FETR GKFELISLEGLLFDG SYHLHASVSDENGHTLSGHVKGF EYTTVELVLLRLN
ARLERGRDPHTGYRELTRVIPSARDTRAR

30

<SEQ ID No.:0613;PRT;Methanopyrus kandleri>
VDDEFQEAGKVVKRVLRAAREIDIGDRLLIEA EYLEECVRDQGAEPAPFVNLSLNE
VAAHYTPSPDDEVEVSPGDILKVDIGA HVNGAIGDAAITLSFDNDLGERLAEAAAREAL
EAAIETIRPGVECREVGRAIGEVCRDRGFKPVIGLTGHQIEPWN LHAGVSIPNDDL P
GYEDKLEEGMVLAVEPFVTTEDGEGDVKPGSTVEIFSVRNPNQRSRLNLHRIYEDR
KSLPFARRWVGKAPRVKFELLRLSKLGAVKAYPELVEVNGEPVAQWEHTV VTER
GCRVLTE

35

<SEQ ID No.:0614;PRT;Methanopyrus kandleri>
VETVRISVL DVVRRIADVAALSVFEVIRDGPLDVLGCTVFNIELARRLVNKGLDVRLV
SSEVG GPKGLPVVEEPASDTLLVTEPLTFYSEYHLLRSHALVLMFRYGNPGFKECL
RGLDCTMLLPEIEGRPLPD LHTAFVAVLQEAVTSASEGHHVVGLRVSDTSDYFIPNS
DPAEVKRRDDAIVVRAIPPYRLREGRVWEAVARA VDQVRFRRVSR CFQK

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<SEQ ID No.:0615;PRT;Methanopyrus kandleri>
MKKDELFLLSVLYYVLEYLKMEGKTREDDVKLYDEFNVKPGHLHKT KLQHKCAVF
LLAYVIARAISSELPKA EGLGQRLGKLL EELFEELKRRGEEVPVEPP

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<SEQ ID No.:0616;PRT;Methanopyrus kandleri>
VKKDFTLDDIETTADIKIPDNPLDMVIGQDHAVEYAKLAAKQRRHLLL VGPPGVGKS
MIAQGIAELLPKPREQIEVYHN PANPERPIVKVTRDEVEKEDSDTLLSPEEVPEPVA

5 EQLGFRCPSCGEYSDDPCRYCPRCGAQKYSARTYRATQYDRATSRQVAVIYERVG
DRIRVVKPDSEGEKKVLVPLDRKPFVQATGASETELLGDVKHCPWGGDEQLGEP
PYKRVIPGAVHEAHEGVLFIDELAQLGPLQQHLLTAMQEKEYPITGKNPQSSGA AVR
VEGVPCDFILVGACNIQDLPMILSPLRSRIQGEGYEVL MKTTMPDTEENRAKLAQFV
AQEVERDGRIPHATREAVEEIVKEARRRARRVIDGERDALTLRLRDL SGVVRLAGDLA
VMEGAKYIEPKHVRAAIKKAKPVEDQIIIEYGSLEEGLRRDVATCSLSSPAAQQRVIQ
GDTTDSYYHQEDKRGYI

10 <SEQ ID No.:0617;PRT;Methanopyrus kandleri>
LSKGRTDYNGAVKYVIRAKLRANGYVERPDVVGAI FGQTEGLLGDDLDRLLKT
GRIGRIDVKLRNENGKTVGEIIVPSSLD RVETALVAAALEQVDRIGPCRAEEVVSID
DIRKEKRERMIRRAREILRE MVSEVTPDSSSELVQKVKEAVEDVEVEEYKGLPAGPNV
EDSDAIIVVEGRADVANLLRCGIKNVIAVEGTNVPEAIVELSKEKTVTAFVDGDRGGE
LILKELLQVADVDYVAKAPKGKEVEELTRKEIKRALERKVPVEEYLKEIGERPKDKER
15 EKGKKPKPKRPERRGRPRKKKARP KRGPQERRLLDRLKRLKGT FRAEFLDEGLK
PVKEVELDELVEKLKSEDGVRAVLDGVITRRLVEAAREKGVKYVVG VKEGDLDPEI
KKDVKIITMS

20 <SEQ ID No.:0618;PRT;Methanopyrus kandleri>
LADSVLINGYGTIGKRVADA VDAQRDMEVLGVVKTSPDY LARLAVEEYGYPLFVPE
DRVERFEDAGIETEGTVEDVVLNAEDYGLDVVDCTPEGIGARNKETLYEKAGVKAI
FQGGEEAEVAEVSFVAQC NYEEALGADYVRCVSCNTTALCRTL GTLKEEFELGRVY
VTIVRRAADPHQVKKGPINAIAPNPVTVPSHHGPDVKTVM PDIDITTA AVKVPTTLMH
MHVVRVELKEEVTSDDDVIDAFEEARRI WVPHGEGLGSTAE LIELGRDLGRKRYDLY
25 EILWWEESINVEDGVLYYMQAVHQEADVVPENVD AIRAMTELEEDPEASMDATDSA
LGVLNSPPL

30 <SEQ ID No.:0619;PRT;Methanopyrus kandleri>
MVYTESEHRVCPKCGSTNLERDEKHGELVCRDCGT VVDYLDYGP EWRAFNADQR
AQRERTGAPISERHPHKL GDTIIDRDRTRGRRLVDWRFRRLKRWDRWISNDPVSR
NIRSAVELIERVCSQANIPRSIVDEAIRIYRKAVEKDLVRGRSIENTAAAALFMACKKR
KHPRTIKEIAKLFGITPKDINRTHRVLRLHNLNRM PAPPDPKQYLSRFATELG VSEDVE
MLAREILEKAEEKGLTVSRNPAGLAGAALYLAGLLKAKEYIEEYREKMKEAESEEEK
EKLERELNEKLRTCRR TQPEVAKISGVTEVTIRNRYKELAEELGLEVPDPTKIDVPA

35 <SEQ ID No.:0620;PRT;Methanopyrus kandleri>
VRDIGSQPAAGVRSMKVRDRAL EIRERISRGDPLYDFTGLASRPKVDAASDELRTY
LSEALILPEIRELCREHFD APEYEVLVAPRTTAAVIATILALEPRSVLHVLPEDGEAHP
CVEEGCRLAGAEYEEVEESEIPDL DGFDLVVVTGCDVRWNV VSEDTLREVASAEAV
40 TLLDDASGDRVRRRLHGQKPGPRYGFDLVVTSCDKLMDGPRAGVLIGRDDLVEGVR
RVCEGYGWTVDGPTLAAVKRAFE EFELSSLEARLKE LERVYERLKD ELDVERTGAG
LVFHGVEREVEIGLGLLRRYGIMTIT ALGYERVDRTLRFNLLTEDAERFGYDRFVEVV
KGELS

45 <SEQ ID No.:0621;PRT;Methanopyrus kandleri>
MEKLPGKAPAYVCQEC ELVTPLRRCPECGE GTDPLRVTPPAELRPVGP GYLEFIRE
VLVEEGLPADLVRDDELLANRAPDLDYLDEIVAAEPVLALRYDLRKDRWTIVLKPE
GARRLHELGGKSIEVDRGAAEAVREGKNLFAPGVTSADDVEPGEWV VIEHGGRPV
AFGRARMSGDEMVRNRNRLAVEVRGAVEGSPTYFRGRDFEDVARAHEEYV SERL
50 EEAVTFARENVSPTSRTFASFSGGKDSLVTLLVAAEAGVERALFVDTGMELPETVEA
ADRAAEAVGIDVEIVEGDPEIFHRVTEALLPPSRDNRWCTLA AKLTPVTRYVRSEFG
RGCYTLVGVRRYESEAR SERGRVWDS DAVPGQVNVAPIFDWSSLDWVLCVHSKD

LPYNPLYDEGFDRIGCYMCPASKVGDFRLSERVHPELWEGWMETLERYRERHGLP
RDWLRYPVWRWLRPEGEIRKVASEESLRWGERVLGRWREVPPEEAARGFRREC
PGCGYCGAVGSNRCEILEASLRRVFR

5 <SEQ ID No.:0622;PRT;Methanopyrus kandleri>
LALGRPSYRGGRVSGGRDPDFAELESSSLEQDREIFHCDVWNSVHAVSLWEAGRI
DRSTAAGIVEGLVTVLEEGPDRLPEDAEDVHEAIESRLHEVVGEEAGWLQLGRSRN
DQVATSVRMRLRERALDLSRELVLGLGRALLDLAREHAEVPIAGYTHLKRAQPCTIGF
WMSTYAAAVARSARGLLRVPGMDECPLGCSAFPSTVPVDRHREAALLGFRKPAR
10 HCGEATALRGPILFLGRLATAASELTRLAGDLIQLCSDELGVVEPPDELSSTSSVM
PHKKNPDALVELVRAELTVVAGLKGLGDAVHGKLPFYNRDLQVLNGLLWDSVNR
ELCVRVLRKVVEGLDVDEEAARGTVLGSHAAVDLAELVAERAGLTFREAHKVVG
VSARLDREGVPMSPERADRVVEELEREGVKLRVEEVREVLSLKRTLRRPVEGST
PGRLEVTDLRLRAELAAERLEGTWRGRIERALRATEAAVNRLGVEGFAEVYRGY
15 WDGEAPG

<SEQ ID No.:0623;PRT;Methanopyrus kandleri>
MALLTLILALGFTSLPLNAPPHLSADVPTYPWVGVPDVEVTYVNNWDPNLNPE
HIEDWKCIAREILGDPKSWWEQYTAGTPLDELVEYAAKKIEYWVSPYDDVDPHGIKY
20 RYYNTRYGAWKTLQLGRGNCCDHAHVMVALCRASGIAIRYRHEVTRFPCWGTCD
HVCVEVGLPENVDGKSQDVKWVRMDPTNPNSQCVRLKATYPNLPF

<SEQ ID No.:0624;PRT;Methanopyrus kandleri>
LTFVTPRVSPTESDIEVGSWKEIEEIVSSLSSGLVRITTRDHEDIYDCFFIVEGGAVVG
25 AYLGRIRAEELSAAEAVRAIRDVDSVGFALLDVYELEPELLELIKRVNDECLLKEPFT
PTEVEEAAPEVEEPEDELLEKLGVLDIAIESVEAVLEDYFEEEDPFEEFKRMLRA
LGTQDARVYLRVKVPEGVDERMLEEVRRDLEHALSEFSIDGVEITPSLKEKETVTLRI
RDIMKRIRGG

30 <SEQ ID No.:0625;PRT;Methanopyrus kandleri>
VSVNENALPLVERMIERAEELLNVEVQELNGTTVIDCGVEAAGGFEEAGLLFSEVCM
GGLATVELTEFEHDGLCLPAVQVTTDHPAVSTLAAQKAGWQVQVGDYFAMGSGPA
RALALKPKETYEEDYEDDADVAILCLESSELPDEDVAEHVADECVDPENLYLLVA
PTASIVGSVQVSARVVETGLYKLEVEYDVTRVKYATGTAPIAPVADDDGEAMGRT
35 NDCILYGGTVYLYVEGDDELPEVVEELPSESEDYGKPFMKIFEEADYDFYKIDPGV
FAPARVVNDLSTGKTYTAGVINVDVLKESFGL

<SEQ ID No.:0626;PRT;Methanopyrus kandleri>
MALWLDVPVAPTDSFYRKLFEAVWRILGDRARGIASERLPALRRCYTVSPDSSTFLS
40 ENVPGVRLLDVFRPGELLEILSETVSGELGRRFWGSLVSVVERGDVAGLEAMKR
SIEALRAVDVTPWLDALALDVLVALAEDVGEDILGDSLQVLAERLDVDEDGVLRVSP
LALEFAGYCFEMILLGYVVAIRKPEEIEVVSVDVFAVEDVRRDIERRISEVKSGDLEL
AAEVIEEVLAPYLRVVTDVRYGYLEEARSMDSIALEVDGFSVSIAPKELDPEWDRHV
45 QEAIEKLTGSGGKARRVFN

<SEQ ID No.:0627;PRT;Methanopyrus kandleri>
MSEESVVAFCCYEUGYGAADLAGTGRAQYPSSVRIVRVPCTGRVGIEHILTALAK
GAWTVFVAGUKKGECSYEDGNLKCERRVQAACKLLEELGIEPERVEIYFMSSAEAD
KFVAVKEMHERAKELGPLA
50

<SEQ ID No.:0628;PRT;Methanopyrus kandleri>

VKRVELEGIPEVRGTVCPPPSKSGSHRALIAASLCDGSTELWNVLDAEDVRATLRLC
 RMLGAEVDVDGEERLEATVSGFGDSPRAPEDVVDGNSGTTLRLGCGLAALVEGT
 TILTGDDSLRSRPVGDLLAALRSLGVDARGRVVRGEEYPPVVISGRPLRERVAVYG
 DVSSQFVSALLFLGAGLGALRVDVVGDLRSRPYVDMTVETLERFGVSVVREGSSFE
 5 VEGRRPRSPGKLRVENDWSSAGYFVALGAIGGEMRIEGVDLDSSHPDRRIVEITREM
 GAEVRRIDGGIVRSTGRLEGVEVDLSDSPDLVPTVAAMACFAEGVTRIENVGHLR
 YKEVDRLRALAAELPKFGVEVREGKDWLEIVGGEPVGARVDSRGDHRMAMALAVV
 GAFARGKTVVERADAVSISYPRFWEDLASVGPVHSV

10 <SEQ ID No.:0629;PRT;Methanopyrus kandleri>
 LTEIARAATRYEPEETAALRIATWYLVRRSLDFEAPATLFWAGRTYARALLRVYHVL
 SIREFLTICIERVLGTSYDLNEDVVAAPCPECAGFPRGYESVCDATRGFIHETLAAF
 GREPHKVREAKCAVRAGELVNACAFEIRHSNLH

15 <SEQ ID No.:0630;PRT;Methanopyrus kandleri>
 VDLTEETLLRGAEATAEAFAPYELLTYDRLTRIALIEVARETGTAALFEAGRRLVRILG
 GDDLESVLCAFAEVFGAEVEVEGDTVTVRKCECAGLRGIDGPVCHLTRGFITEAY
 RLEIGRPVTVAEATRCRAAGD

20 <SEQ ID No.:0631;PRT;Methanopyrus kandleri>
 VNTLGRFLFRVTTWGESHGPAVGAVDGCAPGLPSEDDVQRELDRRRPGQSGVS
 TPRSERDRVEILSGVHEGRTLGTPISMIWNEDVDSSKYEPTRPRPGHADVTYR
 WKYGHVDYRGGGRASGRTTVGIVMGGAVAKLLREAPSNDPLGIEIVGHVVRVGS
 VEADPGDLSAEEIMQYAESNPVRCADPDAAEEMLGEIERARENGDSVGGTIEVIAE
 25 NVPPGLGDPVFGRLDGELAGALMNIPAVKAVEVGSVRCSEMHHGSEHNDPIWWD
 GHPVVDGDNSGGVLGGISHGGRLVVRVHVKPTPSVSVPQRTVDLESEEEVEIEVE
 GRHDPICIPRAVPVAESVVAIVLADAVLRAGYVNPDSVELPAASVEDRWRTLKRHL

<SEQ ID No.:0632;PRT;Methanopyrus kandleri>
 30 MPGCGIGHGDDPTQSRGRDEPARHVGADGSNREAGCLLARELGDDLESTLTTFAD
 LTGCEVDADEDVTVRNYPECAGYPGARGPVCHFMRLIAGAHELETGERTPVEE
 VRCRAAGDDVCEFRIGRKPREPTVPRLDGLDERALRRMAHAASEREPEEVA AFL
 ASEYTLKFHPADAAPIFFRAGRLYARALLRLYNPLEMTSFLSIVEDVTGAECHLGE
 GNRMSIEPCPECAGFPREHEPVCHGVRGALHETLGTGKEVERVEETEECAAVTGE
 35 LVGRCEFRFELRGL

<SEQ ID No.:0633;PRT;Methanopyrus kandleri>
 LEKLVLLPGPVMVHEDVLLRSAKQVMNHRSEEFEEILTECVELSKYLFQTDGNVAIT
 GSGTAAMEAAIYSLLEPGEEVAVVNGKFGERFADIAERRGAEVRRVEFEWGKVA
 40 DPERVEEALADSDAEVVTLVHNETSTTVLNPAEEIARICREYDALFVVDIASSLGGVE
 FRMDDWGVDVVCVTGSQKVLGCPPGLALVAVNDRALEVMEEKDAGSYLDIPKYLE
 YLEKDPKQTPYTPAVNAFYALHEALKRLKEEGLEARWERYRLMQRIVREGIRALGLE
 LFVEDDEIASPTVTGVTYPEGVDDREFRGEILRDYDVVVAGGQDHLAGEIFRIGHM
 GEVRIRDMITAVTCIGLGMRELGVDDVDVGAAAEAMADVLSVS

45 <SEQ ID No.:0634;PRT;Methanopyrus kandleri>
 MRRLPRGVLCVGLRAVAFSADLSEDDVRVSRGLLRRVERDLKELRRGFRDELMYV
 VLGPVCGDDLAVVYVVEEGALEDVNAAVFDLFREYGGEDVMGVSESPEGAGEGPS
 YAEAACPESEYQDVVTLFDTYAAENRVAEVAEVCRRAAEGLCYDVGGGPVQEP
 50 EIPGVGYVGPETDDPVLIATTERLDQVGPTAGAILGAGRGAGARPVRRGAPAEVLP
 GTVIFSVAILNGNVIDGVRALEEGTGTERWPLRYL

- <SEQ ID No.:0635;PRT;Methanopyrus kandleri>
LVTVLEEEEDPHAVKHVVRALRAGKLVAIPCDTVYSLSCDATNSEAVRRLYAAKERPK
DKPVSVAVHSPEKALELLEPVPRLEAALETLTGPGVTIVAPRRPGVVAPEVAAGRRT
5 LGVRIPDHPFFLRVVRFRGKPIVTTSANVSGRPAPTDPDDEVFEQLGDRDLILVEGEC
RFGEPSTVIELTPEGNIDILREGAMPKEEILETLRGTTSGA
- <SEQ ID No.:0636;PRT;Methanopyrus kandleri>
VPEKGLKPFLTGFRETVDLTDGEGVLVYSGCAGTCTPFAELLAFTLRGTDLEQYYYS
10 IDLRREYLRMELRDHGYTVTDEREELESADVVLGGLAMPISDATPDAREFLEEL
GNPPLVGVCFMNMFERAGWTDELDFHTIIDGYLEVTVK
- <SEQ ID No.:0637;PRT;Methanopyrus kandleri>
VIEKEPVPLQVG DYRLYFRLWALGDADAISDVL YRELYPHEWLEGSREVVDVGAHV
15 GAFTVLA AAHGAREILAIEPHPDNAELLRRNVEENDLNAEVVEAAAYDREDVVKMYL
SPSTVAHSVELVRSRETIDVETVALDDLGTSPDLIKIDAEGAEERVL RGAERTLEEHA
PVLLISAYHYPGQEEDLRRWLEDNRNYRVEVLVRETSPYRSPALRVPVIVAEPR A
- <SEQ ID No.:0638;PRT;Methanopyrus kandleri>
20 LIVLHARDCDPKACTALRAHRMGLVELTRHPGDVPTGAVVLDPTVEKALSREDRDA
ALERGLVAVDCSWEHVHRYFGPLRRRCRHRILPYLIAANPVNYGKPKCLSTVEALA
AALYILGFRREAE EFISRFKWGPAFLELNRRERLEAYRRAETS AEVVRVQEEFLPDGL
- <SEQ ID No.:0639;PRT;Methanopyrus kandleri>
25 VGGNAYIAVTGTDAALNPVVEIWTAPTTSVITVIPPNPTVPVTMAGTISGVKLT KIDAT
HLLLAILGTNAYAVLDITNPSSPSLT VVRTLAPPAGFTNVVIDDADGPYIVAHDSANPA
SAVVFKIAADGSVTD SLTFSVTAGNQPATISMYGGSPMYLLVTDTS GECYLVKDG
SLSVVPLLR T LSVGATPIFATKQFVFVGS GGMAYNVYVWLPTIRTHRQMIPIPPGWM
GMVPNVVVLEVPEVSGEDNIGIDEEVPGFYGFQ LKTPTVPAQVTYSSGQIVAQATG
30 GVSSDMVSEVYPTAYGIVLNTWPNAIPALVIDIANMDCYLAVV VHNVTIDLSAETISVT
PESPTYKIVGAITVKASWEDLFGMAHQKTLDLTGRLSATNP DGTVPVGGITYDPVTGL
VTIIGAKEPKVLVKIDLNDYLEGLRTVALGTGVPPVTSLEQRVSNLEHAVSTLSAQIG
SMSSEIANIKSDINNINAEIQEIKNGMKKGVPVSPMVVLAGLLAALAVLRRR
- <SEQ ID No.:0640;PRT;Methanopyrus kandleri>
35 LGNLPRPAAWLAALTAVLLAVVGPAGHLTQTNAALNPQPVQGLNVEGASKPTSLVI
DNSGNLGAVEAGNPPTQAWTTAPIVATVYTQPKVAKAEMVGGNIDFTVSRHRHHD
RYDLQVHRHRDHQREHTDGIDRPADHTDFVPRCAHRHNHTDGLPPARSGR
- <SEQ ID No.:0641;PRT;Methanopyrus kandleri>
40 MAKFPEAEARIFNKLICMKCNARNPPDATKCRKCGYKGLRPKAREPRGG
- <SEQ ID No.:0642;PRT;Methanopyrus kandleri>
MGVFGYLRERTPCHLTLLDPVDVGPEEVPEVLESLVKAGTDAVMVGGSTAHASQV
EAVVEAIREVADVPVILFPNGPEGLAPNADAVLFMSLLNSRNTYYLIEAQVKGAPLVE
45 RFGLESIPTGYLIVGEWGTTVSVVG DARVIPFDRVEVIVAYALA AKHLGMKAVYLEA
GSGAPEVPPEVVRVSGIGVFTIVGGGIRSPETARELAEAGADAIVTGT AVERDPD
LAAEIVEAIKDL
- <SEQ ID No.:0643;PRT;Methanopyrus kandleri>
50 VEYPSIPRTLRLIMWAAYWINAVSVIATILLSRSRLNPPEQTYSFLAIAVFLAALGR
ALQRITGRRVVLTRDAVKFDGERIPYGDIEDVRVVEAGAVSVVEIRTTDGRVHRLRV
ADPDRFLRDLVGLLRFKGP

<SEQ ID No.:0644;PRT;Methanopyrus kandleri>

5 LRAVALLSGGKDSTLAAHLAVEEGYELTHGLTVVPSDPESMMFHPNADLGALVAQ
VMGLEPVRIRSGRDDEADIEEIARVLEGLDVDALVSGAIASRYQKERLDRCLCEELGIE
HVHPLWGMDFEELLELLVERGFVMIIGVSAAGMDESWLGRRIDEDFIEDIRRLYEK
YRIHPAGEGGEYETLVLDAPLFERRIVLERVEKRWDFSGELIVEEARLMPKRR

<SEQ ID No.:0645;PRT;Methanopyrus kandleri>

10 VGRDEGEDKFDGGDEGTSDEPDVPEIRLDGESDGPDDHPEGPDSSEPQYPQNI
LSHEGDHTDIDVSNTNISTAESDLEADLDSNSYSESSSES DATQYTAQYSDLDQDT
DQIQDSRSESISDVESVQESSSESNDPDVDNVDNVDVDDPADPGVIYDVDREVN
DDRDTYVEENVYYGDTDRTIYDPRDSDTGSVDPSSDPTTAGDQVVVGSED PYMV
LDTQKGQVDVLVGEDPTTINMGQSELSQLLDLVNWL DGNAPSDVLDLLYQLLAYLL
15 ETFYGLIPLDNILNMIQQAIEYALSGELGLDVLNQLLGVLETATSPLYAATEILKFLGDL
DLGLDALLDIDI

<SEQ ID No.:0646;PRT;Methanopyrus kandleri>

20 LSRNVLRNRGQGGVEYLLLAACVWAFLEISVLWWVMAKDAGRAAQEAAKMAAE
MARQKGVEIVEKYANAIT

<SEQ ID No.:0647;PRT;Methanopyrus kandleri>

MAGLPTARPDATPVRAPERIRVPEPPRPDVEQARVLRVLLTVRRGVLPFLGASYR
SVNGKVYGPYYEARWKPRKGERGRTIYLGKSENE SVRFLEAWLWEVRRAPRLAE
HRKAKWFVARAVRRALAALLARFEGDP EEAELEAGEVLRKVGGILTGMFPDPLRTY
25 SRPRGGRKLLRMLLGRTPGEFRDVLLEMLSPWPPWYCLTLLERLHGRTAAREYHR
ARVPRPGSAA

<SEQ ID No.:0648;PRT;Methanopyrus kandleri>

30 MRTWKIRVRGIVQGVGFRPFVYRLCTEMELDGHVRNLGSEVEIVVKATCDELEELIR
RLKEEHPPLARVREVHAEETEDVGPGFRIVESEES EDVELQIPPDAPVCEECLIEI
FDPKSRRYLYPFTGCTNCGPRFTIIEGIPYDRENTT MVD FPLCEE CRREFEDPEDRR
YHAQVVCCPRCGPRYRLLDADGEVVEGEELEAIREACELIEEGKIVAIGIGGFHLAC
KTTEDEPVAKLRLRGRPQQPFVMSGSLDDVRTFAEVDGTAEDLLTGVPVRPIVVL
PKKEPFPLSELVAPGLHTVGVMPLPYTGLHHIMFERFLDEPAIVMTSANPPGEPMAIR
35 NSDALRHLRGIADYYLVHDDRRIARCCDSSVVRVLDGRPRSLRRSRGYVPEPIELEW
APDDLTVVAVGPELDVTACVLHRGKAYPTQHIGNTSRAQTLDFLQETVERFLRLRL
DWNVDVAVACDLHPSFATTGLARRWAE EHDLELVRVQHHAHALACLAEHGLDPA
EEPAIAAAMDGYGYGDDGSAWGGEILYVDGNEYERIGHLEPVSMPPGGDAATYRPL
RMTAAHLHAAGWSEEEIREFLRLLEEWPHALKHGEREVEVILHQIEHPTIETTSAG
40 RFLDAVSAALGVCHERTYE GEPAMKLEAVAVRVDHAPDPDVRNGSVRVSSVVA
RAAETGDLRYALTAHHAIEGFAEVIDEHRDGE PVAITGGVFNNELITRGFRELYGAD
LLEHHEVPAGDGGVSLGQVVAAVLELR

<SEQ ID No.:0649;PRT;Methanopyrus kandleri>

45 LDHDAVAMLM EVRADLKEVKALYQRLARIIRQAGLTNDY EYIISTAAALLVHDKYEKA
REVLSGLKNPREGAMLTMAALREASLLDEILGEHTVEPAELVNVGVGSFDEALKKLD
EYLVGEGEVRRQPGPDMSYL RATDGAISNHLLGRTVGYTLNTTPRDYAEFVENS VH
AFAYARLLPSHQWRVRLSLEPYVTNPLSPPSLMRTLELVDELDP ELVMSEL DVSE
NTFLRYKYKTLVRYLLVHPDHEICEPTELGERALDDEEVLA EIVLKRGFWAILSKHPNG
50 GSVAEK LAKRSV VNRKMKWKDEVDISLLVDAASDTDR AEAE LPVVLAVHAEELSTV
HLAARAGVSTGVAAEVLYEHFPEQDWEGERFGL

- 5 <SEQ ID No.:0650;PRT;Methanopyrus kandleri>
VGGRPGVDCGGFCRYCYFRGVDWEEKRPFPGCKNCPPGSPGCDYCGRSVWEDN
GPFRPPGVVLQEVGMSLGFRREREATVSGGGDISNYPWLRELVASLRDLGIRSVQL
GYTSGKGFEDPEEEVELCDLGVRSVSYTVFAWDPELRREWMGDRSPEASLACLEV
FADRCEEVMVA AVLIPGVNDGDVLWKT CERLEELGIDALLMRLGTREEHGII LGNS
LVLDVKPHSLDEFKRIVTEVHEEFPRVTGTPLWDPETSAPFALRTLGEELRELLPP
VEVECSLITGRVAAPLIREVFRHVEGGEKVDVVPVEKDVACLITERDLERLDVSSLKR
TVVLPGRALVHDARAEELLKRDGFERVVLRGPDRLTLDGEASCEVDREEVLEFELN
AFRDLINTVNILGE
- 10 <SEQ ID No.:0651;PRT;Methanopyrus kandleri>
MAREAKDVTDL YDDRGNCAEEVPIEVLSPMRNEAIQSIVNDIKRTVAIDLEG IENAL
MNATVGGKGMKIPGREMDVDIVDNAEIADEIEKMIRVYEDDDTNVEPMYDGKRLL
VQLPSERVKVMADPYSGLTQAGMAVVAIIDVCEVDMWDANMVKAAVFG RYPQTI
15 DYFGGNVASMLDVP MKQEGVGYALRNIMVNHIVAATRKN TMQAVCLAATLEQTAM
FEMGDALGPFERLHLLGYAYQGLNADNMVYDIVKKHGKEGT VGTVVREVERALE
DGVIEVKEELPSGFKVYKANDMDLWNAYAAAGLVAAMVNVQGAARAAQGV SATIL
YYNDLLEYETGLPGVDFGRAEGTAVGFSFFSHSIYGGGGPGIFHGNHIVTRH SKGF
AIPPVAAAMALDAGTQMFSPVTSKLIGDVFG EIDFREP MKYITEAAAE EAKR
- 20 <SEQ ID No.:0652;PRT;Methanopyrus kandleri>
MLERKIPEGAKPEVQIFPQRLLSADTTEKLLNELLERVEGIGRIVIHG PGLPAVPFGP
ARGKPVKHPERRPIEVHGEKIPMKVQTGQIIVEIEDEDRLDDIVEEIEKICREILPCDFE
VQVGRFTRHKPTVTDYLFKGE EGVKKLDKRLGLVEPRARLADRVSVLKKKGED
- 25 <SEQ ID No.:0653;PRT;Methanopyrus kandleri>
VGRETYAVDCRAAMGMGKGGSLAQRGTIAETEITEVVAVAMSPGSRHITKPVCEIT
YALREAGIHTSVLV LNAGSGVPAEAPVQTGATMGIEPEEIERINRHEVAVIHLGNVKQ
HIVWKARLILKHCDVPAVIVCQTPVDFEDFAEVGCRTRIVEPPEPETVGEVVEITGV
30 IRGETVPSDKINEIVRKVRRALRYARRRSR
- <SEQ ID No.:0654;PRT;Methanopyrus kandleri>
MAEKAQFY PGETDVAENRRKYMNP NYELKKLREIPDEDIVRLMGHREPGE EYPSV
HPPLEEMEEPECEPIRELVEPT EGAKAGDRIRYIQFTDSVYFAPIHPYIRARMYMWRY
35 RGVDTGSLSGRQIIEVRERDLEKIAKELLETEIFDPARSGVRGATVHGHALRLDENG
LMFDALRRYRLNEETGEVEYVKDQVGIELDEPIPVGAPADEDDLKERTTIYRIDGTPY
REDEELLQVVQRIHELRTL AGYRPEEAEGK
- 40 <SEQ ID No.:0655;PRT;Methanopyrus kandleri>
MSSAEELFMKALKEKFEE SPEEKYTKFYIFGGWKQSERKKEFKEWADKIVEERG V
PHYNPDIGVPLGQRKLMSYQVSGTDV FVEGDDLHFNNAAMQQMWDDIRTVIG
MDTAHRVLERRLGKEVTPETINEYMETLNLHALPGGAVVQEHMVEIHPGLTWDCYAK
IITGDLELADEIDDKFLIDIEKLFPEEQAEQLIKAIGNRTYQVCRMPTIVGHVCDGATM
YRWAAMQIAMSFICAYKIAAG EAAVSDFAFASKHAEVINMGEMPLPARRARGENEPG
45 GVPFGVLADCVQTM RKYPDDPAKVALEVIAAGAMLYDQIWLGSYMSGGVGFTQYA
TAVYTDNILDYVYVGLEYVEDKYGIAEA EPSMDVVKDVATEVTLYGLEQYERYPAA
METHFGGSQRAAVCAAAAGCSTAFATGHAQAGLNGWYLSQILHKEGHGRLGFGY
YALQDQCGAANSLSVRSDEGLPLELRGPNYPNYAMNVGHLGEYAGIVQAAHAARG
DAFCVHPVIKVAFADENLVDFDTEPRKEFAKGALREFEPAGERDLIVPAE
- 50 <SEQ ID No.:0656;PRT;Methanopyrus kandleri>

LVGFTEIGLAAAMGALATIAGAFEDAESDVGSQSNPNSQVQLAPQMMNFHRYFNKA
ISGEPVSYMLYGAAGTVTWVMMTKFGLPFLAAAAGVGVNALIHMVFATTAHLGR
MASAAEFGHPIYLDVVLSHLGPIAGFGGIATFAIVSLAYIQWALLKHPFPLPLAALWG
5 VTVGAIGSSTGDVHYGAERLYQHYPFGGGVPAAHGNITRKAETGIRNSMDSVYFC
AKFGNPLTGCLVFFSTWAGLFGQWGAVIAMGLVTLGCLIVSNRVEKKARESY
GTYEDVEMDEICDPV

<SEQ ID No.:0657;PRT;Methanopyrus kandleri>
VDKLI AVLVLITLGSIMVNVGVHYVPVGGAPAAMATATGVGTGTTQLAAGSGLTGLIT
10 AAAMSQKPFLVILWNGALGAATMMAITMLVGNFIYVYGVGCPPCSAKVDKDPITGW
DQEAYVTPGTEGHGIPVTSFVSGILGGLLGSGGAMVYYALYKVLGMSAALAGILA
MGFFYANAVLASYNIGGTIEGYHDPKFTRLPKAVVCSLVFGIVASVIAYYLSTLM

<SEQ ID No.:0658;PRT;Methanopyrus kandleri>
15 LILRTLISAVAPGGEEEEVEVAVAISPLKLMTAGLICGILGTAFWVHPLIPALAVIPV
VWVGADAVRRVAGYGLGTGVPSIGFMGLGGGSVAAILAAALSGNTVPAAAAIIGT
VIGAVVGALLGVLD RRVIKMKIPVMERCSTEIVASGTLALICLMAAVAGDFTWSAVYS
KVIATGLIAVLWAICAISLLHPFNACLG PSETQERTLWLGAECGSLCTVAGLATANP
VLLAGAAWLITFWKFWELTKRDAADVWTGIVPKGE

20 <SEQ ID No.:0659;PRT;Methanopyrus kandleri>
LAIVLIDPESQIAMDAVTGAVAEWSEDVVTLDVMPLYEKVEELEQYVNDMMRAMDP
STTTWGTLPREGVHETAGFLT NFAGHFVIGTMIVALVAFTLAAVYKLHALRLLGL

25 <SEQ ID No.:0660;PRT;Methanopyrus kandleri>
VLEVPEKAEP AEGWPVVEGDYVVGDP EAPVHVVTLGSHIEEDILKAAGEDKVAIAGP
CKTENIGIEKVIANVIANPNIRFGVLCGA EVTGH LTGQCFKAMYENGVD PDSGEIIGA
EGAIPYLENIPEEAVERYRDQIVELVDLIDVEDVDEIVKAIEECVEKDPGAYEEGPMTI
30 SLEEEEEEEELAEVAGMPVSAETVTVEYRINDVRVGVKSIGAMQRYMAGYLSGRTM
GLLIGIISGMIFLFLPMVVLGGV

<SEQ ID No.:0661;PRT;Methanopyrus kandleri>
LAEEESVPKMVAPEDDIREIHSRLDEIERRLDFVWGEVYQRF GKRIGRDIGILYGLVI
35 GLYLCLMYILLGVAFR

<SEQ ID No.:0662;PRT;Methanopyrus kandleri>
LFYYPGKEQKVCDICGVKVG GQPG EYPTVLAGTIFYAGHKIVKDEDKGIFDEEAAEE
LIKMEELADETG NPMMAHIMGESEEAI RYLDWVADVTD APIIVDSTEAEVKVAVK
40 HAQEVGLAERVVYNSINASVEDEEIQAIKESDCNSAIVLAFNPMDASVEGRMKILTE
GEEGVSEKGMLEISDECGIENPLIDTAYTPFGSGAGTAYKVT LAVKAKLGLPVGGAP
HNVP SAWDWLRDFM KKLKEEGKEEWAELAHESSDWGSNVVAATLCCDYLLFGPIE
NAPAIWPV VAMVDALIVEANEDVGVEPQVEEHPANIVR

<SEQ ID No.:0663;PRT;Methanopyrus kandleri>
45 VLPTPGVPRLELEEEELRKHPDEAKEFVRSVLSRLLACEREIDRTLEALDGCYVEPG
PAGNPTRGDVDVLPTGKNFYSVDPRKVPTRRRAWKV GKKLAENTIERYLEEHGRYP
ESVGIVLWASDVMRTGGEVLSQVMWLLGVRPEWDESGIVSGFEVVPLEELERPRID
VVVRISGMFRDAFPNLVKFLDEVFEAVRELDEPEGWNFVRKHALDHRIFGDP PGAY
GAGVNYAVHASAWDDRS DLADVVRWGGYAYGSDVYGEEAFSEFRRALSTVRVAV
50 SVNQSSHEWDVLSCCCHFAFHGGMVAAAEHHS GERVECYHHD TDPHRVITRPIE
EELVRLVEQKLANDEWIEAMLEHGAKGVGEWLKRVENLFGWDATTGRVPSECYEK

IEDVLERYGPRFSDENPYAVEYARERLLEAKKTGSVALADDVGRVLLHLRLDADVLV
GLDDQRVDHGDPRDRRRVLDRTREQQVAAQRRRHVVGAPVGGGLVG

<SEQ ID No.:0664;PRT;Methanopyrus kandleri>

5 LRVLCVCSGTMLKAARDVAERFSELKIDVAYQDDPIDPNRYDLIVLLKVTNVNLPTDH
DAEVVAVPLDGSTGIQHLNTAPSSVVERAAEYLEKGGKENLENERGFESFEKLGVP
VLNAVVSWYTDRDGWRESEGGSPADVAYGISLAELQGRIDPVLVGTKRDRGEFE
PLPERCRLAARRAIRWARLRKDPAAERRVAVVLNNGICSGGEARIGAAMGLDTFES
10 LARLLQHMAEEGYRLDWVPRDGRELEREFFRRKAFDEFKTRVEDIVASGGAVDL
VPLDRYLEWFEELEPEELQERMVETWGEPPGDSMVLDDHLVIAGIRTGNVFLTVQPK
RGCAGTECNGDVCKILHDPHCPPTHYYAFYRWIRDEFRADVLLHAGTHGTLEWL
PGKSVGLSRECWPEVCLGDLPVVYWYIVSNPSEGVQAKRRGYSTLVDHCPPPMG
TTEAGLEELEERLEEALRDPDREDRRLFEEWEVRSGAFIEKGLHVIGEPAYDPERLS
EFLFALCRNRLRELIAESAGLDLEELTERPEAENDLFGATNAEVLRLALDAVIRGLCEE
15 TVSEAHHGPDRLKG

<SEQ ID No.:0665;PRT;Methanopyrus kandleri>

MGLFSKLFRRGPKQIAESERVGTGLAVSRDYIIVASVELGNTTTKCILTATDLKEGV
TYLIHKEVRMTRDVRPPRSGEVFGKTVWGVELTRDSVAEMVADTLKSAVKANIKI
20 DDVHFVVRSTGVTAGFASPEEVGEMIKALADGCLKAGVPPNRMTAAMSKEQIPEPF
REHSLIDKVYFDGAVTGVPKPPAGKEVVANEMEGELVMAGIKVGAKSTKVDFRNP
MAIDYGTTLAGRITNDELPYADTIGNLCLAGAIMDAIARGCGEIDEEIGCALDLP
EPDVGEKARELAEEAHEYIDIREIPANRERFGTVPVNPKAACKAGLKLGC
SDLSRLTEIGREAYEEGGYELLFGVLDWTATLIAKRLIETALDLDLIDENTAIGIT
25 GTTGKKPELICRMIAEEFGDYWDPEEDLVFVDDGLARGAATMARCMNCLGTPENP
LGGNRGGGCILGLRIKHQQEGS

<SEQ ID No.:0666;PRT;Methanopyrus kandleri>

30 LLRRDAWRQARFVHPRSYREKILRSLFFALTARINQMRRLDPEEYPEDPIEGYDRFL
EIVREYAEDPDYDSPLLLLYESLSAAYAIFLRGEPVHPPGTEFPVGVKVRRTDDCY
CPIKERREDQPGSFCTLCPAEQDPEVVS

<SEQ ID No.:0667;PRT;Methanopyrus kandleri>

35 VRPVTVVVGSHPVGHEPTLKDRLLLEKLRRRSAYAPAIHEAVRDQTEAGVELVSDGQ
VRGDMIEIFASHIPGMTVEDGPAVIGRVEPPRFSPVLVDYREATRVAGEVEVKAILTG
PVTLCYSLEVRTDLYPSNDHSSLLKDVARALSAEARLLRREGASVLQVDEPILSAGV
TSVKKVARYVNTVLKAFKGGTRVLHVC GDVTEVYLDLEENIDADVDFHEFAGHPEN
LEVVAEGDSPIGVGVRSDTDRVESLDEVVGLLEKAREAMGDRIEFVDPDCGLRKL
PREIAKKKLEVVVRKARDRVFR
40

<SEQ ID No.:0668;PRT;Methanopyrus kandleri>

VLTVTDIVEKIAEILERGDGRYLIMGMVQAHGLGLRSLADSVDPVEVLATIEIEGFGK
VPHKSLVRKLAEWIEERDLDPEDLVKAGWARFELEYFEPELWRR

<SEQ ID No.:0669;PRT;Methanopyrus kandleri>

45 LVVNPSTAEAAATVILVGKKYGDVVGTAALGLFFGVLLVILTAAYVIRVKGTDVVFVSKRR
DRLPLLTVGAIYHAIGALVMCKVGVTRPMVCLMLTYAIAAMAVAGVTRFWKISIIHAAS
MGTVMGAIAWLGEWWAGIPWSIVTAVVCWARLKLNAHTGYQVAVGVAGGTLLTYV
LMITLIPR
50

<SEQ ID No.:0670;PRT;Methanopyrus kandleri>

MKAETYALLAALLWGLAPVIEKVGLRGMDPMTATLIRSLAAVAFLAVVCLAVGRSQV
GGLKYVGYMIVGGILAGGLGLYLYLALSSGQASRIVPLSSTYPLFATLFSILALRERP
SVETVVGILIVIGAVLVSRE

5 <SEQ ID No.:0671;PRT;Methanopyrus kandleri>
LQFNRRVLEGEREELEIRIGSANVKKRLAMLIREGDLVLEERRELEPHHEEVVLAGY
EEPEEGVPTERLKVLRVKRVEFVG

10 <SEQ ID No.:0672;PRT;Methanopyrus kandleri>
MRGLIPDHMLERGRVLD SYREPVERLLSERRMPEEGWPDDVIATFLWELSRMDT
DKDPKAARIGEREARVASRLAEESVFGFCHGVGRSGTLVDPQPKAPGASIMYALTN
RLVTDFLRRLGFRIEGAFVVP GATGLSIALCLSALGEGEEVIYPYAAHKSPIKAVRLA
GFGMRVVDTEIEGDRIVDPGDVEEALERSESPA AVLSTLTFFPPRSSDPLPEIAEL
15 CEEYGVPHVVNAAYGIQHEQYRDLLNRAIKRGRVDVVVSSTDKNLLTPVGGGIVYA
PDEETLREVSRAYPGRASAAPVAHALISLLSLGMKGYRRLMRRQKECKALLDELLE
DLEARRDDVRVLDVDNPIASAVAVEGHDPVDLAARLYVRRVTGPRGVRADDPFGT
SRLRGYHSNYITINAAIGVREEDVKTAVERLERELEGE

20 <SEQ ID No.:0673;PRT;Methanopyrus kandleri>
MRYVEEFRERLERIFGDRAEDVYRYLLEGRPPTYVRVNTLKADVEEVVENLETAGV
ELAETPLSYAFRVLSSPGLGSSLEHVAGYLYLQDLASMPPELLDPEPPGPVIDLC
AAPGSKTTQLAQLLGEGVVLAVDADPRRVRALVHNVNRLGCVNVIVAHADAARLR
ISAPFLLLDPPCSGEGTLHRDPHALRTWTPKKPGRFARTQLRLLRAALRMLPPGGR
LVYSTCTFSVEENELVIHEALGNDDRYRIVPSVPRWLEPHTVPGLTEWEGRELRED
25 LRHAFRIDPASLES DGFFVAVIERRH

30 <SEQ ID No.:0674;PRT;Methanopyrus kandleri>
VAGDNEATEVDKRDIALLRAL EGLSRAFEWVPEDKLLERLPM DYSELATRLEKLDSL
GLIDYRYIPTYQTYAARMKERAYDTLALWDMKKHVDYERLGTIIGEGKEATIVNAKD
PEDEWVAIKLHRYHAPEFRRIKKTAYAAVKVRGEELRVDDHRIDVPRAKAQVEMK
VLQRLHSGKGFVP GPRAINRHAVAMDMIEGHAPGIPAPLLAKIKVKNPEEALEVILED
YREIVLEGHYVHGDFSEHNILVTPDGELYVVDWPQAVPIEHPSAPKLCYRDLKNVIE
HFRRKYRIRVPDPKEVYDEIADDLQSLMEEKKEEYERHKKAAERTLERFEESVERV
EGKREGRKAGPTEDEEDRVPGGGDGGG

35 <SEQ ID No.:0675;PRT;Methanopyrus kandleri>
VKVVRPDRRRTRRTGFPEVVM AEGKTPEQVSEALEALLRSEGIAIASRVDPELLDDL
EIPEDADVEYDEAGRVLVLKDPEYEPYPYRGGRVGAVAAGTSDLPYLSECATVLEAL
GIEVHTEIDVGVAGPHRLLAAVRRLRKFRPHAVVAAAGMDGTMPVALNAMLDVPVI
40 GLPTPVGYGLGGSGEAALLGMLQSCSPGLVVNVANGIGAAAAAVKIVRVCLEGEK
PSKKPRNSRR

45 <SEQ ID No.:0676;PRT;Methanopyrus kandleri>
MEKPSRNTYIPLTIVGECPECREYHRGRECPECGQDLRRPRLRPQFGGRGPHTLF
YLEKYDWD TMKAVRRIAQALRKHHRHFGIAGMKDKRAVTSQRVTVRGVPPGVLAR
LRIRDLKIVPMGRARRKLRPGDLWGNRFVITVRGAKVRR LPEALRTVRELGGV PNY
YGLQRFSGSRPVTHVVGKYVLEDWEKAVKTFLTLEYPRESPEALEARRWLKEHW
GEFKEALRRFPKFLDYERHILEHLARHPHDYINAFRR LPMWIRRMFVHAYQSYLFNR
ILSERIARGLPVHRPVEGDVTQDGLPTVPLPGFRTELS DGPQGEIEREVLEEEGVRL
50 EDFEIKSMPELSAGGDRKPALLRVYGLRAEAIGDDTVRFTFSLPRGGYATTVLRELL
GSEGVYAD

<SEQ ID No.:0677;PRT;Methanopyrus kandleri>
 MVKSSHVPIVSPNDPAVVCNCTKEEYKRAKRERGKLRFAGLCEECSAAFYEY

5 <SEQ ID No.:0678;PRT;Methanopyrus kandleri>
 LSVLERIIRGSDLDREEARDLMCRIVGGELSDVEVAGILVALRCKGYTSEELVGFVD
 GMMEHAVKVPDVERLVDTAGTGGDELDTFNASTLAGLTAAAAGVPVAKHGNRSV
 TSECGSADILEALGVNIEADPDTVKRCIEEVGFGFMFAPKFHPAMKNVMPVRRKLG
 RTVFNVLGPLTNPARERVGTGQVIGVYSENLLDLVAGALAEVGVRGLVVGGLDGDV
 10 ELSVTCENEVVYVDDGEVTDRTVAPEDVGLDRADPKDVAGADPETSAAEARKILG
 GELPVDHPKVQMTAFNAGAALYVGEAVDSLEKGIQRALDVLEEGRALEVLEKVVDL
 SS

15 <SEQ ID No.:0679;PRT;Methanopyrus kandleri>
 LGRKEKMAEKCRKLMTEPGKIRNIGIIAHIDHGKCVAPETKICLADGRFVRADELFE
 LKERGRLVKCDESEEVYELREPVGVSSLDKDAVEIVEGKITHVWRLKADKLVEVEVK
 NGRSIRTTPEHKFLVLDPSGEIVEKRADELEIGDYIVCTQKLVHEGMSEEELKREVF
 RLGRDFFVHLPEEEAESVLELAKERGKIKALWETLEVDIEENSFYQLRKGRIRADILV
 DLAEELGLDLADLYDAVEVSYSRNTKSTKPIRLPEPEDLFYLAGLMFGDGCWNQLT
 20 NGSEAIQGEVKRIASDMGLEVRVRRYEGKTARIDFPETVPRILEALFDYPRRKAHRI
 RVNDLFLTRAPLDCIAEFIRGYFDADGTVEEGRSAVSSTSVSREFLEDLQLLLQKFDV
 ASYLREGDGAYTLYVSGARSLERFPGFREPEKAELKKLMEKASSSELEKVPISGEI
 LREVRGDVPTTRMFNCYSNYEGGQVGLTKSSLEKVISTLEAVGVEGEALERLKALA
 RDDVCFLEVVRVEVEYDGYVYDFTVEEHHNFAAEGFVHNTTLDQLLAGAGMIS
 25 EELAGDQLVLDLDFDEMEQERGITIDANVSMVHEYEYEGEYLINLIDTPGHVDFSGDVT
 RAMRAVDGAIVVCAVEGVMPQTETVLRQALRERVVPVLYINKVDRLINELKLSPEE
 MQNRFLEIIEVNMKIEQMAPEEFKDEWKVSVEDGSAVFGSAYYGWGISFPFMEKT
 GITFKDIIIEYCQQDKQKELAQEAPVYQVLDMMVVKHLPDPVTAQEYRIEQIWPGDPE
 SEDGKTLRKCDPNGKLAMVVTDVRIDEHAGEVATGRVYSGTIREGQQVYLASSKKE
 TRVQQVGIIYMGPDRI RTDEVPAGNIAAVTGLRDWWAGETVTDPEDPIEPFEELQHF
 30 AEPVVTVAVEAKNTQDLPKLEILHQIAKEDPTVKVEINEETGQHLVSGMGELHLEIIA
 HRIKERGVDIKVSEPIVYREGVFGVCDDEVEGKSPNKHNFYVTVPEVEEEIVEAIE
 EGKFNPEEMSKKELEETLMEYGMDDAKAVETVKGTNFFLDKTVGLQYLNVEVME
 LLIEGFEEAMEEGPLAKEPCRGVVKVSLVDAEIHEDPVHRGPAQVIPAIAKRAIYGGMLL
 ADTHLLEPMQYIYVTVPDYMGAVTKEIQGRRGTIEEIQQEGDTVIKKGAPVAEMF
 35 GFANDIRSATEGRAIWTTEHAGYERVPEEELEEQIIEIRERKGLKPEPPPKPEDYIEDY
 GG

40 <SEQ ID No.:0680;PRT;Methanopyrus kandleri>
 LEGNPYLDRLYEMKVFGKWDPTVEVVRDPGLKDYICLKPMYLPHTGGRHAKKRFA
 KAEVPIVERLINRVMRTEKNTGKKHLAYNIVKRAFDIIHERTGENPIQVLVQALENAAP
 REETTTIYGGISYHEAVDSSPQRRLDIALRLITEGAQQRAFRNPKPIEECLAEIIAAA
 RYDTECHSIRRKEEIERIAEAAR

45 <SEQ ID No.:0681;PRT;Methanopyrus kandleri>
 MPGKKSPAGEFAARKLREKRKKFRWKDERYKRRMLKLDEKADPLEGAPQARGIVL
 EKVGVAEAKQPNSAIRKCVRVQLIKNGKQVTAFCPGDGAIDYIDEHDEVVIEGIGGPK
 GRAKGDIPGVRYKVVKVNDVALSELLKGKIEKPMR

50 <SEQ ID No.:0682;PRT;Methanopyrus kandleri>
 LAVKLETEQIRMIALFESLTGAHVLDLDCVIDDEHNRAIFVKEGQIGLAIGKKGQNVRR
 VQEQLGMDVEVVEHSEDPEKFIRNALFPARVKSVRVTERGNKKVAIVDVPESERGR
 VIGKGGRIKKARILARRHHGIDDIIVT

<SEQ ID No.:0683;PRT;Methanopyrus kandleri>
LQEIERQIRMAVETGDVVLGSNQTIKLLKLGKPKLVIVAANCPAEIREDIEYYAELADV
PVFVYPGTSMDLGDVCGRPHVVASMAVLDDGESDLIATVRKAMEEGAAPS

5

<SEQ ID No.:0684;PRT;Methanopyrus kandleri>
MNVEELLEEVCKEEDVELPDSVHREIVEKVSSEDEELKDADEETVRKVLRALVRNYK
CRQIERGDAVGVLAAQSMCEPATQMTMRTFHLAGVAEIDITGMPALERVLSLPYH
GPPTWVIELRLKEPYRSDREKAEGVARKIEETRFEELTEYIEVNPDECAIEIGLDEERI
10 EEHGIDEDQLVAFVREHTGGACHLEGDVLKVTLADVESASELAEIANDLREAVVKGI
EGVLHASVQYDEDEEEYYILVRGSPEGAPGRPPRWISQRARNRSKVAKRAYLMLQL
MQLDEV DATRVNTNDPKIVDVLLGVEAGRNAIEQLLEEVYESQGISVDPRHFMLISD
MMSFWGELRSVRSVGGYSVMELKGSPLTKAAFEYVSRVLTETATSGDVEELRGVL
ENIIVGKPPVGTGTVELTVDYSKFKEGEEEGES

15

<SEQ ID No.:0685;PRT;Methanopyrus kandleri>
MTLMEEPRVQDPPKYVKRILFGILPPDKIRKMSKVEVTSPEYDEDEGYPIEGGVMDT
RMGVIDPGLRCRTCGQPAGRCPGHFGHIELARPVLHPRYAERIKDVL RATCPECGR
VKLPEDEIESYLREVREGIRPVKSVA AEVIDRAEKRESCPHCGAESRKITYQKPTTIM
20 MDDERLWVPDIRAWLEKIPDEDEVEILGFHPERARPEWAVLTVLPVPPVTMRPSIILET
GERAEDDLTHKLVDIVRVNLRLKESLEAGAPEPIEDQWDLQYHVTTYIDNEIGGV
VARHRTGGKPLKGIVQRLKGKEGRFRQNLAKRVNFSARSVITPDPELDPFTLGVP
EAI AKELTPERVTEWNIDRLRLKVLNGPNKHPGANYVVKRDGSRITDENKEKLA
EDLEPGDVVERHLMGDGPVMFNQPTLHIQSELGFRVRVMPGKTFRLPAACYMGV
25 GFNADFDGDEMNLHVPQSEEARAEVRELMGCYVYHLWPPKNGHEDVRNSPIHEAI
VGIHLLSRAWIPLREAYQLLEEVKKEGDWFEPTVVKLKPEAKYRRGFEEIHELEFV
CGQPREGEPLVTGRQLLSVFLPDWLD RVELENACPDDEEHGKVVEIKGRIVRGFL
DEKTVHIGIMTEIVHRYAAREVARGESYPWFKA AETTLRAMDKIGRLGLRFVTRYGF
TLGIDEFEDIYERFRDEVERLCDEAAKKAKEI IERGERRLQEEHETCNRSRIERGE
30 MLERNIESEVMAILNQPRVETERLLKKHRDLFNPAYIMPESGARG SITNIARMALIGG
QQAVMGERPHRAKHNTHEHIMEKIVNYSYTD RVTPHFEKSLIPGVKEGGFVRSGFFE
GLDMVEYFLHAMSGREGLIDKGFR TADSGYLHRRYVTTALDLIVDSGGRVRDSANN
VIQLTYGEDGVDPAKKWGLNLDVEKALKV VKEVVLEEERRVRGGAG

35

<SEQ ID No.:0686;PRT;Methanopyrus kandleri>
VETRVDAVEHV LKGPEREEDRTPVYLN GR LIGYVEDPEEFVEKVREL RREGVLHP
RVNAAYHEDLNEVHVNC DRGRVVRPLLVEDGEVKLTEEHLEKLREGEISWKDLEE
EGVIEFLDAEEEEENALIAQSLEEFYSMPKEERKKYTHVELDPAAIFGTCCSCIPWPES
NSAPRNTMGTMTRQALGFYA ANHPIRMESRGHLLYYPHRPLVKTRGTEAFDYDE
40 RPAGQNMIVAVLTYEGYNMEDAIIMNESAIERGLARSFFFKTFEDEARTYPGGMKDK
FCIPEKEVRGYRSEDAYKHLGEDGLAEVGERVEGRDVIIGKTSPPRFLEEF RPEELP
AEERRESSTAIRHTDSGIVDSVIITETSDGHKL VKVRIRDERVPELGDKFSSRHGQKG
VIGMIVPEEDMPFTEDGITPD LILNPHALPSRETMAHILETLAGKAAALSGKRIDGSAF
TSNPKEAYEEIKMLRELGFEP TGKEVMDGRTGQKLEAEVFIGVCLYRKLYHMK
45 DKYHARSRGPVQVLTRQPT EGRAREGGLRFGEMERDDLVAWGASLFLKERLLDES
DKYEAYICPNCGELCYVHAATGKTICPICGEVRADRVEMSYAFKILLDELKSFCMDA
VLEVGSLSEREEGEEE

50

<SEQ ID No.:0687;PRT;Methanopyrus kandleri>
LSEEDYLALLEGYLRRNEELLGDVKTHPLIAHHFLSYHWLIDEG LQQLIEQMEPIEPE
VEGASYRIEFERIEVGEPSSIEPDGARRKIYPMEARLRNMLYSAPLYAEIVMYEDGE
EVERDNVYVGELPVMVRSKVCNTYGLSEEELIEVGEDPKDPGGYFIINGSERVLM SL

EDIAPNRRVNEKIRERGVLDEVRSRVYSRGERYRGPVDVIDRKGRLLVIDMPAVYRK
 FPVVILLRALGLTEEEIMEGVGPEFATIMAEQMRVLVKEEIGSQEDALEYIGRLSRPD
 ESREERIKRGKEVLAKYFLPHIAEVDDDDDEKLKEVFRKKADEVLMVREVLELKY
 RRVKVKSVRDRDHYANKRIKLAGDLLYEAYEYAFQQLAREMRYQFERAYSRRGREGP
 5 TIRYIVRPDKVTDHIRSCMSTGTWRTGHYRPRGTGVSQILERYTWMSTMSHLRRIRA
 ATELGVGKWSIPKEARYLHPTMHGRLLCPNETPEGANCGAIKNLALYAEVVHKDADE
 DEVIEILEEIGLETE

<SEQ ID No.:0688;PRT;Methanopyrus kandleri>

10 MAERLDPDVVLNHLVLPKHEVIDDEEEIEKILEELGVEKDDLPRHTNDPVVVALSEK
 LGKRIKPGSLVKIVRDSPTAGKTVVYRVVTPNPE

<SEQ ID No.:0689;PRT;Methanopyrus kandleri>

15 LYRDFREFRPDLEFRACVACGECAAVCPAGSLELRKGPVEAFCATCRLCEDVEVS
 RLPDSDVASLLCPAFVQRIARLLPHPWIRESRGTGCGLCVERCPVEALRLEEGRV
 VEGDCELCGTCDICPVVDCIIPPAAVREVFLGFSEASCVDGCLCVETCPFGWGE
 GAWRSGWIRTWC

<SEQ ID No.:0690;PRT;Methanopyrus kandleri>

20 MIERVKIENLRSHSSTEIEFREGINVLVGPNGAGKTTVLEAITLALFPRTFRSYDHMIR
 EGERRAVVEVFWGADGHKYKVRREFYRGGGQRNPRLYREEGDGWKVVASGRA
 EDVDREVMNALGGVDRDVFREAVYIRQGEIAKLVEATREERKRIVDRTLGLAEFKKA
 REQAHELLRVAEAKLETFRERVRDLKGSKKELKRVERELEELKREVKELEPEVEELK
 ERLNELREAKREFERLEGEELRLLENKIESLKGRRDDLRKLVEEGKEAERELQRLGDV
 25 PSKVRELENEEAELRRRIEELRNLLDDLRLSLNRLESAAAAELEGVKRELEELKDEAG
 VDPERLVEFKDKIVEASERLRLDLREEELKRKLEKVSDELSELGDREETLQSEYEEL
 QERLDEIQGELKEIRVKEKELLERIESLREAECECPVCLRLKLPREAEKLLRDAEKEL
 ERLQGREDLRKERRELKDRLESVRRELEGTKERMWRLRERREELERELEEIEELK
 EELADLSRELGVEEDRLPELRLDRAVRAESLLRDLERRRGDVLRLKELEERTLDRCEK
 30 VIGRTPSGVEDVEEELRRLEEERDHSVQKLREAEGELEERYHNLEEKVKRAREARKE
 LKRIERDLEDAKGRLEQVERNLEGLRERYGSEDRLEEELESVEKKYERVRDKLSEV
 KGRLNGMEKRREELKKQVRKYREAKERKERLERVVEVLSLCKEVFRYSRDVAREK
 VLPAREEREASKILQDLSDRYGSRLIEDDGAVIRVSVPGGHFIEADRMMSGGEKIIIGLAL
 RLALAMVGSSFAFIMLDEPTVHLDAEHRERLAQALRELDLGKGRVRQAIVVTHDEE
 35 LEDAADELWRIENRAGESRVERYSG

<SEQ ID No.:0691;PRT;Methanopyrus kandleri>

LRMAHVADVHLGHALMNLSREEAVMETFERLMEEVRECSVDVLVIAGDLFEHARP
 KTEALYLAVEKLSELKEDGVEIVATAGNHEIRRRKGAVSPISVLERMGLVRHLYYSE
 40 RRPERHRYTATFDGVRVTFHGLQYLPKNSFVERAKVIRAKYRPDPEADVNVAFHQ
 ALPGTIPDESEIVEPAYFPEGHDYYAMGHVHVPSSREEKIHGSPAPYPGSPEPLTFLE
 VKDERGAHKRRGFFLVEFDRGGLVEYEFVEVEWSRELSVVEVSGERWEEELRRR
 VRRGQIVKVAKDTGASPEEVEKVAIEAGADRCVVELRERRREVEEGDETEGPLDL
 EGIIREGVKRARAATLTRVDVPDDVVEVALEILRGVREDNPPDLGDVEGIVAGEPP
 45 SEGSEESSEEPESDGEVGLVEEVKVESRGTSSEGMSRAGSKLGSSGRPSLDR
 WIG

<SEQ ID No.:0692;PRT;Methanopyrus kandleri>

50 VRRVERKVVGYYVESPSVREFTFVSRDAEDVGVDYVVVREPDSGDRELLGRVE
 DVRRDVHEGIKGEIAKASMSGRPVPELDWTVVARVEVLGALEDGRLRDPRMPAR
 PTDVYRLPESELEELFSKGEVFLGRLKDSRARVFLGLNELITLHCAVLGMTGSGKS
 YTVGVLIEMARHDIPVVVIDPHGEYTSREPSHDRERLERWGLEPEGLDDVEVFAP

PHSEGVKDYPITIDTTKLEVDDFEVLAPELSKRKAAPQVLEEVVKELQRRYRETGEK
YSLEDVVEELDAQAKRARASGDVVQYQAARAVLRDLRPLLRYGIFDMAESPDLRRH
VRPGRVLVLNLRGVPDRAQQIVVTHFLRRLFELRQRDEIPPVFVLEEAHNFAPAGE
ERSSSKTALSVMRDFAREGRKFLAGLCVVSQRPGRVDTTVLSQCNTMIVLRTANPD
5 DLENIRKSGEGITREALERIKGLPTGTAFVTGSAIRIPAFVDVRPRMTRHGGETPDVR
EIVERWKEDDAEEDLDLGI

<SEQ ID No.:0693;PRT;Methanopyrus kandleri>

10 LSGELDRFLERGRVRRGRDYGRILLEDISRRLRELAEDVINVYRRVSPGRNPVLRRLV
LEVVAERKREVEPEHPDPEVTFGVGGEGMREYQGVVLYVTRAAWSEADVLSS
WDFGVLSRTRTPQMRVAARRVKLESDVATRAVERGGEVVMVDGPIVPHDLKGAN
EDSPNRRDYWGRILDARRTMLEVCEEEGAVVMGIVEDCKAKHLLRDVRDELGEDL
PLKALPNPVALSRELDGGPVLEVGERTHAFELPDEDYPVVREFEEATGYSIFTFYV
15 RTTRYSPVVRVEIPEFVDPDEAAGIVLGTSTIEYGGYGIPLPLVMADEFKVGSRSLVD
WIEEEVLTELASDGRFDVIFTVFRRLRRESRPKRRSSAEAREIHLRHGGEEGGA

<SEQ ID No.:0694;PRT;Methanopyrus kandleri>

20 MGARTFGQVSVEFVLLSIIVLTAAGRIAGRYMGPEYEWYCVKKAUSDVAKTREQVAV
GVTYRVGDQVEISGNLSVVRQVNDRIEYELKYSQDNPAAGVVDLLRRNVLLQVY
VALYGRPKSVSEISNPVKGSWANYQVEVSGGESIKVVVERTKE

<SEQ ID No.:0695;PRT;Methanopyrus kandleri>

25 LRVRSWFSATPSGQVTIEFAALLLIMLVLSAYFTYSVVGTFGLGVSDVMALIEARYIAN
YVANAIAGTISWLPDWQSTANQIHLPEKIGNSEYYLKVRVKGEPPGGEIVVILRLGG
RFEKKVGVASVPILVGWPSGGWPPRTPGVVLIDPRTVDDPVPTPVTEWPPGDEW
WVSTSGKPFEGFLYVIPPGG

<SEQ ID No.:0696;PRT;Methanopyrus kandleri>

30 LFMSFSRQASLEYLLVLLIGVTAAGMAMAFVKEGMYGSGGVEEAASALEAKAMAE
QLARVLDKAAACDVGTRFTVRIKGRPGTQGSYTVSVEPTGQHDEYYVIVEGNVVK
GVAKFYSFGKDVVENVTVPGVVEVSVVEGPKLVLRNA

<SEQ ID No.:0697;PRT;Methanopyrus kandleri>

35 VGLYHKLPLLKERGQVFTLDAMAALLLSLVLSALDYIHMVSWPTISPRQEVSSIAV
VQPVKWGWVATGVYRGELPHLEVKEIRVTDWNVNGNKWTAKVDVSDKLPPDKKIV
MAFLVLMVGDNHVVDAYDPNDKDLGVYEVNGDENGERTVFTVPIDWRGNIGWW
FPYNYNGRIWEKTLVDLTVDDRGNPLLVNKTSDDNIRVRIGVKIRGYWGRQYRDKT
RIVLVLAPKQFDVAVQVWRPDGPQIGPQPYDDRDGKTGIPVKGSLATDLSRNKNPD
PVTNFADWYGEDVDKDRLENPDENPVITVKDLVMRIGRVFGNWRPWTPVGTGPYR
40 EYYDKSDGTVHKLEDAKDPNGDGADGIVLTRHGAQIDDSYHLFAAYVMMPRTFSSV
CPLDAPILALTTQRNGPPEFVVYANVRTPQDIKIDWANVDES LGASNIGTNTTYRW
NKTEDLDFYNDELKYYKYDDWYSRSIGIPADYLYGASGYSHLVVIDPEAQWPITPA
GGLIGTSSTVEQVLRTHSVLYAYLRPLNRSHGVHTHFNVDTHGYWYFKFPGGIP
VQGGPQPRIVAIWIKAPHWLYQWAPWADSVSASLGANTRFNNVPGDGRSDELD
45 MTINIQRPDMPSVIKNWAVQDVYMFNGLDEDPDNFWIYIDDEEVWPDDWVPPSIE
DLKSLSGGKIATPGHTIRVREYEQPSPEAVEIGPFNVLVLYKGTMYLYLPRLKRSKE
DAVNALRQEFERLGIDPDDPRVRITVAPSRGYDKPHKFRLVAWQEERVLYTPEYLR
RLSTEALSQLQSSGALS YVAMEWEYYQDTGDATKLRRALQSLQPLLSSVLGVHFKL
50 EVWDEKNKQWVTLTLDQGPAL

<SEQ ID No.:0698;PRT;Methanopyrus kandleri>

MIPRGERGFLFTPAAVALALALLLSVSYLSYRGRESGYLIRCEYIKPVINEAILSMT HQ
QLSRAVYLGVDLNGTELPGGKNGYRYGRIAVHAGGTNIEWVASPTGLLAPYDI
VDVGRLKGDYDSYRTVIESLRYIDYELAKLAVDVHDSIKQTQGAEVWIVPRCYVGD
GSLYWDTSDPEHPKVRLSWYGRSDPKDVSRTPIVDAHDPFTIYVHLDIYLIAQVPG
5 WEQFNLHLGQTTVQASIQGYAPSGNENKAVFDPLPIWAYYVSKDRWGDGPLRFKP
MIVMGNYQVAVGQGGSIGGERVGGSDVIRFYSAYLNEVNGDGRNSEADEDKLRRLA
HVL SIPGKMLPWDDTKLLNENEVDGETESQWVILPYFPTRENVLGDDVGRPPNFIE
RAAGILYVLP SNRVVSVDGIEDPDVDVIQRCEAGMETLIPALPAEEVDVWAHGPFGT
VDWMAWMEVLASRSGKLRGVINGVRASEFGPPER YDDRGE PVRLFRLYGFNSND
10 PVVRQINSLLAGIGLQLATDADRRKGFALPGADILKWFLPGTNTDMVLKNGRVIRV
WP

<SEQ ID No.:0699;PRT;Methanopyrus kandleri>
LRGQITVDALAAGLISAIILLVTDVARVVT AHGITS LR TYELYASVDRFAASLTSPSW
15 VGANLTSYDIVWLWSEPLQWTWGGAPLRTGVRMYLAVDAYKWTRYSEGGS LDSP I
KVNDGRMMADLVFPND DLNVSGEAVVKSYDVMLVKRGDTWVYDENLPQVWGNT
VSYSGNVPGVKVWVTVSGDGLYGWVRWLHKRYNQLIQSGLSEEEAYKELAREAI
SMNSGGNRIVFYSSSGWATDDPVELVRRIVAEGEGSGLSLTIIAIGGRPFTVTLSGS
ENEIFWNQWTAGLFPVKLRVGVTAG

20 <SEQ ID No.:0700;PRT;Methanopyrus kandleri>
VSVEWTILLMTVIAAVFALGIALNASNSGFVSTTGSGWAAGMKELGSEVVRRAATP

<SEQ ID No.:0701;PRT;Methanopyrus kandleri>
25 VSGQANIELLVLGVLVA AVAIMAAVIGYYMPLKKSSSGLGDVARAQNEKISNVCH EL
ATKWM

<SEQ ID No.:0702;PRT;Methanopyrus kandleri>
30 MALGVRGQGGVEYLLIIAIVAGCAIAVGVIAYYLPISGGKQGLKDVGSAVSGGFERFA
SSAKKL

<SEQ ID No.:0703;PRT;Methanopyrus kandleri>
MDVGFLAGLAVATVAAITDLKWGIVPNRLTYPAIVAGAIYAAVIDPSHLGYALLDAGV
AFGVTLVLNVLGVLGGGDVKLLPSLTLFLHRGDRITTGIDVLFNSILLYAPFALLYLTV
35 STALDRGRPFLKELCLNTTILVLASLIAGGVATILGTVISSVVGILLILAVWKVARSYES
KLKIVLPALVVPVAVLLNLRASPIAVLWEVGIAVALSTAFFTYRWAGKERNVEELREGE
IPLEIVRTEEGTERVGR LKGALLVATGRAEPVVPSPGDGFTEEELEKLKRLGIDRIR
VGHTTTPFAPAIAAGYVVTYMLQGSPLSWLWG

40 <SEQ ID No.:0704;PRT;Methanopyrus kandleri>
VKLVITVDLFGGERGHHRLGALPRDAHLTVFTDYLSILEMRDALEAVDWDIHCTTYS D
VPLTYVPEEDAQAHIELSSEFGECFRAPALAVNKALLRKLPELGFDADSSGWSRKG
RVGRLYEVTEAPIVCDVMDRKFLNKVLSRLDSYDVVVL RSGSEIPGNRHFKIVDKIAS
SLSVAPLSEVLEEADGRVRAKFNDRGILTEREHL LLTALSEVWRLHSELSEEVGDRE
45 LILAH LASESFRNPQRVLT VCKRFAEELGSEYTERLARVSKRPVIGALRKL SRRFQIE
MEEEDERLRVQELKRRVEAIDRGIRMLAQDRPIEGWNEILSVLSG

<SEQ ID No.:0705;PRT;Methanopyrus kandleri>
MLRNIGPVIRLIVLILYPLALPLARILVIRMSPEYLRRMDYLLQVSNIDVPYEIYLSASLIY
50 VLIGMSISGPLIPKLGSTAFLLAVMPLYLLIHPRIVQSLRIKDIEENLPDALRQMVEELR
AGLSIFETIRNVAESDYGELSREFRIVVRDMDTGKTFEEAILDMAERVNSELLTRAVR
LTVRISMSGGALADVLEAVENDIREVRRIELERKAITTMPCLALALGGLISGLPVGVS I

GAVIGVAMMERMGPTYAMLP MYLQAKDPLASYPLVLGLLSGMAIGIIRYGNMKRGL
VFGLPLGAAAAGVYLAIVSVMPSFLAAGGM

<SEQ ID No.:0706;PRT;Methanopyrus kandleri>
5 LSLPSFSGLAEKRESTSRMLGGRLESSLTAKVRAARHAVRGEQGEDVEKIKRIVLG
IEEEGERDRTAEEINERLRRLCRERANVLETLIEMVQSLSPTLGNRFRGLAPDREVL
QKAGLRISPAAFATFMIISGLMGVLTSPVPAALFPLPLPLKVLGPIMSFLGMMVPRM
MVTILIRRREGEIARQLPYAIRQMATEVSAGLSLIESMKSESSESDYGALSEEFEVIREI
10 NSGTPINVALQRMANRWNV DGLRTMVRFITQAMESGANIAKTLMTLADEIAHEL RQ
RYREYGHKLQALAFPYIMLT LVIPTLVTVAMLLAANLSGAFLVPPPLFGPMIAGMVG V
MAGIFLFIFKSAEPKV

<SEQ ID No.:0707;PRT;Methanopyrus kandleri>
15 VVWTVPRKRNIKDLIGGLEEDDLLRDILGEKEEESKSESPETVEETA EASGEHYEAE
ESKISPLSSEKAAEVLEAHELAEREGWEGKILCDDNIRRIVEYPDQPVPVYISKEYEQ
YYNFERIRTQVLKRLGSQAPPYARDDEEFRKVLDEIKDILSMNIDFDPTEYATLKERE
KAFVELVKENFDAVLEEYPELEVVKDDLALHLLMYEMVGYKEIHPLLKDDNLEEIMVV
PEVVGGTAKHCFIYVYDRDHGMCLCNFRVTSRSIRTVIERISRESGRRIDQENPLL
20 DAHLDPGSRVNATIPPVSPDGPTLTIRKFREDPLTITDIKFGTMSYEAAYLWLAVEY
GANILIAGGTGSGKTTTLNCLCIFIPPEERVITIEDTLELQLPHEHWVRLTTKPPNVEG
RGEITMDDLKNTLRQRPDRIIVGEVRGPEARTLFTAMNTGHDGCMGTLHANTARE
TITRLTNEPMNVPKIMIPALDIIVMQNRFLQRGSGSIRRITEISEIAGMEGDTVQLNTVF
EWKPETDEVTSTEVPSMVFKKIQEKTGMSMDEILHEIEIRKILKYLVDNNIRHVREV
25 GEFIHEFYKNRESVLEKVGISGY

<SEQ ID No.:0708;PRT;Methanopyrus kandleri>
LAEDLPPEILKAVEEYYNRPEIVEVVESLAKPKSIEDLGLPEEYIENLVKVIADRGPV
EGREIYEVTRIPPILEEIVDELQDRKLVGHTGGGPMFQNTTFDVT PKGRELAANIMS
EDPYIGVCPVPYDMYQEVVG DQVEGRYPYIEPEEVY EYAFHDVIGAEAAKRTYYLAA
30 TSGRGLVVFPGPGTGKTFTLSRMAKLLPPIVIPKAVYVAGSVLQLYDPDFHEPRPRR
EQPGDERWVKIHAPFVFTGAELTDDLQGRYDAEKGVYEVPPHVKAHGGVFLVDD
VGRQRDSHAILNRLIVPMENKKDIVHVGGTAVEVFCDFIAAFSTNLPITVFDEAHLRR
APLFVHLSHPPLEEAVNLFRKRLDEMGE EYTEDALETYRRAFTPEEEGGWGLKPTF
AYARDIAQLAQAIRIQEGKDVIDGEIVEKALRKHIVLTQRKGADLDKFGTEETEVPVT
35 TIVVKGVT EEDVNEIEKIPGVRTVSPMGTDVYVDLEGTTPTRFISLLREWGI EFTDVE
VVGTFRASVLAEATTMEELMEGAEEEEETTEGVGVEPETGKEERETEIEEETEDIED
VDDLKDLLEL

<SEQ ID No.:0709;PRT;Methanopyrus kandleri>
40 LRAPYSGRGKPSREELGMIIARIRGREYRFLTAPGVFSWRRIDPGTQLLAENMDLEG
VHSVLDLGCYGVLGIVAAKELGEGHVMTDVNRRRAIWLANENRRRLNDVEDITEVR
EGSLYDPVEDEEFDRIVSNPPIREGLDLVL RIVREAPNHLTEDGELWLWRRKMGSK
RILSEMRTVFGSAEVAARGGGYWVLRAPG

<SEQ ID No.:0710;PRT;Methanopyrus kandleri>
45 VLKDAYTADVTPERDGE EURLAGWVHEVRDLGGIKFVLLRDRTGIVQLTLPKQKVP
KETFEKVPKLTKE SVIRVEGT VQANEKAPGGVEVIPQRIEVLSESDTHLPLDPTGKV
DADLDRDLARVLDLRREEPQAIFKIRNVTTAIREFLEERGFI EHVHTPKIIASATEGG
TELPVVYFERDAYLAQSPQLYKQMLMAAGFERVYEIGPIFRAEEHNTRRHLNEAIS
50 VDIEMSFIESEEDVMRVLEELLAHVFRKVREECEKELEALDRELPELETPFERITYEE
TLDLLSEHGIEVEWGEDLPTEAERKLGEIFEPPFIT EWPRET RPFYTMAKDDEVTT

AFDLMYQGLELASGAQREHRYDVLVRQIEEQGLSPEDFRHYLEAFKYGMPPHGGW
GLGLERTLMTITGAENIREVTLFPRDRKRLHP

<SEQ ID No.:0711;PRT;Methanopyrus kandleri>

5 MRLLVRPEEEELERVLRSEMDVTEVLPDVERIFEDVVERGDEALLEYTERFDGVK
LEAEDLRVSEDDFEVARELVDERTVEALEEAAHRIEEFHRKTLPRVDRITFDVEGTE
CGLTLRPIPRVGCYVPGGRAAYPSTALMTVIPARVAGCREVVCTPPADNDVRASP
EVLVAVEIAGADAVYRVGGAQAIAALAAGTETVLRVDKIVGPGNVYVTAAKLLAYS
10 GLTDVDMPPAGPSEVFVIADDSANPDWLARDLIAQAEHDPHAAAVLATDSEEIARAVK
ERVEELLDAGIEREEIVLKALDRNGWIVVLDLSLEECVRLANRYAPEHLQLCVENPEE
LLQDVENAGAVFVGHLTAVPFGDYATGPNHVLPTGGFARARGALGTWDFVKIPIQ
RLREGDVERLAPIVEELAEREGLPNHAEAVRARRS

<SEQ ID No.:0712;PRT;Methanopyrus kandleri>

15 VKIPPDHPRAEALKIRERLVRGFEDGYVVPQGGLIAQGRGEVFDYLIGEKTIPPAREAI
KAAAAAFKLAEHPVISVNGNTAALCPEDLVELSEVTGAPLEVNLFHRTEDRVEKIAET
LREAGADRVLGADPEHLVRLPNLSSHRAVDDRGIRYRADVVLVPLEDGDRTALKE
LGKTVVAIDLNPLSRTARDADITVDNVVRCVRKITREYERMDPDRAKGVLREYDNG
RVLARVLDHIRERLRVLADEAAGAT

<SEQ ID No.:0713;PRT;Methanopyrus kandleri>

20 LVNVVVCVTGSVAAYRAPDVCRELVRRGHRVRVASEEALRFVGKDALGFAAEEVI
FRLTSRAEHVELAEWADVAVVPATLNTLAKIARGVADAPVPLTAVTSLGAGKRLVV
APAMSLHMYRSPAREILRQLEDMGVTVVGPIIEGKAKLASIEEIVEAVEGELSGF
25 RVLVTGGPTMEPLDDVRVITNRSSGRTACEICRELARGAEVVFVHGPLRVDPPPM
DERVEVETTREMLEEVVKRIDDVDAIVMAAAPSDFRPAERADGKLDSRREHEIRLIP
TEKIVREVFPDFDGVVAFKLDPEPVEGARLLDEVPCELVVANPPETAGAEGSEW
WILDGDGEVIERVKGDKRELARKLVDALSKLLRGDRG

<SEQ ID No.:0714;PRT;Methanopyrus kandleri>

30 LILGGLKLELPICEVCAKTGLLCPGCEERLEQGEITETDVEVSKKLVELKEDHPSLED
VALLRTIDTGNLVVLVTKQGMAGKLIGKRGRISRALSDHLGKKVRVVEEVEDPKDVR
QLRKLQDLILPARLLSVNVVYEPDGERYKAVIHHRDRHRVPADTEELEKAVKELTG
MEVEVTFG

<SEQ ID No.:0715;PRT;Methanopyrus kandleri>

35 MAEEENVVYVGSKPVMNYVLACITQFNEGANEVRIKARGRAISRAVDVAEIVRNRF
MPEVEVKDIKIGTEETEETEEGDTVNVSTIEIVLEKPV

<SEQ ID No.:0716;PRT;Methanopyrus kandleri>

40 LDFQPLELELERGHSLTTRPYGFPETSFGGTRTVHHLVPAVLIMFFAVTAPVASLEP
PSDPYEQWREELRTMFSDYFPHFDTSTPGDVKLTGAKVCCACEVTTRQHVEVQPG
VEAEGVLVATSTKSGADIWVFNWNGWARKLKSQGETPTDAAYAPSNDGGIVLVFV
SPSSDGVLLHAFRLSFVTYLNLPGSEALYVPELEADNKYAIRAPGKVGRIRVLHVG
45 EYSGNVERPLFLVLYTVSVQGKPVVEYGADLYSALVRVDPSNLSLEVVPGSVISDFQ
YVTTFDADVVKVPGYCEYRLKDRRILANWVAVAYAKQWKECGVYLTLLGYSPVDDT
YLPIAHTRLSDEACSLPIGDLALLAHTTSLSDGTVFLTAWTDGRDPISYLDLLNPSPT
DEVIFDGDVWCQPAVLEICANPRILASIRNKPAIVPKGSKPVSLIGIKGLEDSAMFW
LDVVEDSGIRSFPIPVAVEREGDTVYATPCVLAVAVRTTEEKESEGKSGEELLWVLG
50 TSDTRARDPKFVPMNVVLPDDEFNDIRLWEPWASTLTITAEGVKSVVVIPTGKTMTPP
GVPTGEGYVIGKMVVMYQTEQGTEQRFALPSVPIACLRSLTLIGGYLPVIPLRYRM
LKIAVNISGPTITSSEEVHYRVQLSNLPTIREGLSVVIVVSRRNQVVGAAVLKLSEPDH

PVVEGDLEGVEVKSGDISPVIDVWVKTGGSGFYTVVEFFADALGWLMGEEAVTTTT
VRRVRTPSQAPSSGPTEYIPPLGLGVATPSRESESHPGVALPVPVVRVRIRRTERR
MTGLKSPITRASRARSRS

5 <SEQ ID No.:0717;PRT;Methanopyrus kandleri>
MSPFELEFEGFLKVQIGSIEGFEPREGGGLPCPTVSDLADWDRKLFARYRVIAFPICD
MCCMCTYGRCNLAEGRRGACGIDIRSNTARFTALKTCIGAACHAAHARHLVEYILEK
LGDVEIDL GSEVDVMTPIFETLVGFKPKTVSDLEKGLEYIERELTKVLSSVHVQGEM
DPHDYESKALHAGMIDNLALAIADVAQIAAFDMPKGEAPLVEFGPFAADDSKPCILLV
10 GHNVPAGTEVL DYLEERGLDEEEVLGICCTAWDVSRVDDR SKVIGPLSRQLHYVR
MGIADVWLDEQCIRADIVEEANEVGSRVIA TRDLVMAGLPDVTDEPTEKIIKMOVSG
EWMGVFIEDLEKAAEVAVEVAIRVHERRKKEIPQDPKPKLQKEAKRCLGCGDCERV
CPNDLPIVEAMERAANGDFEGLADLFDRCVGCARCESECPTKLRVMNMIEDAWRL
RTKEEKYKVRTGRGPIKDVEIRQVGGPIVMGDIPGVVAFVACPNYPDDVKQVGKMOV
15 EELLERNYIVLTSGCTAMALGMYTDEDGKTLYEKYEDRFDAGCLVNTGSCVSNAIL
GACIKIAAFAKKPLKGNFKEIADYILNRIGACGVLTGMSQKALAISTGFTRWGIPIVY
GPAGLKYQTL YIGDLGDWTVYDARTGKECKEYCPHILKYAAEDWREALVQAVKLC
IRPNDTPQGRQTKLQNYIELYKEFYNELPPDLPLYVRDKNDVPITLRDEVMEYLEEV
GWKPRKGITEPTLLEENVRG

20 <SEQ ID No.:0718;PRT;Methanopyrus kandleri>
LPLPRDPTLIYTDKAEVARAPVLKMFRRANDSLMIVGPRAVEDEEWRELLMKLREE
FRMSAVCTAPYKGNLGRKMGIVEAATLLQRDAPVLGVHPDLVVFTGSRTDVTDRV
LQGLRHARPDLVKVSLNPEYCP SADYSLPTVKRDQFLQELKALVGI

25 <SEQ ID No.:0719;PRT;Methanopyrus kandleri>
LGIEWEGVKVEIGELVVEGDSESEMEGPTRRELLPWDRTLASVYDLAVPGDSEEE
RREVARTIVTLCCEGTAGLISTARLVVELLRQTGENLDPGFDAETPLPLYETLLGSSP
ECADDLEAGLSYAERELTSSVSELLRSHSLKGYESVAMHAGAIGLLAMEIADATPST
30 LMEVTESEEVFEIGTDDLPRRPTVLLVGHLP LLGHIITEELGTLARQVELVGLTHTAW
PNREDHVRVVGPLSMYHEYLSSGFADVVVDGACPGEDVIEAAREGGSKLVATVG
ARVADLLDVTDPVEEAVEVLVTEEDAVYVEEPIKAVEIAAWAALRVEGSRDRREPP
RRAFVRGPPTRLTDVVIRNVGVPVWAGNIPGIVVLVSCPEKSADVEEPAKIAEVLLE
GYLVLVPGCLAVALGSYLDGDKTL YERYPD TLLNTGPCTSAHLVGACIRVGVIFG
35 KLPIRGEFVRVADYVLNRVGACVIAWGGEYSEHLVSAAYGVTRWGIPVVLGPDPEA
GSLLVEKNPKVIDACSGEEVEDPTPEHLRCVSDWKEAAITAARLCMRPNDTPEGR
QNKVESYVELYRELYGELPPDLDLLIRDESDIPVTLRSEIRELLEETGWTPRSRASDP
TLLPEG

40 <SEQ ID No.:0720;PRT;Methanopyrus kandleri>
LTSADLPVDVSPRHEGERIRSGDMYVELAGPKSFGAELFKVVDPEIEPDKVEVIG
PDIDEMEEGGRYPFAIYVKAAGEELEEDVEGVLERRIHEFCNYVEGFMHLNQRDQI
WCRVSKNVTEKGRLEHLGIALRELYKEEFGNVIDSVEVTIMTDEEKVEEFLEYARR
VYKKRDERAKGLSEEDVNEFYVCLMCQSFAPTHVCVITPDRPSLCGSITWHDAAKAA
45 YKIDPEGPIFPIEKGECLDPEAGEYEGVNEAVKEHSQGTVERVYLHSCLEYPHTSCG
CFQAVVFIPEVDGFGIVDREYPGETPIGLPFSTMAGEASGGEQQPGFVGVSYGGM
ESDKFLQYDGGWERVWMPKALKERMKHAIPDELYDKIATEEDATTVEELREFLEK
VEHPVVERWAEEEEEEEEKAPEEEAPAEPTMEVKELPIAPGGGLNVKIVLKNKIY
AEKVIKRADREDKS

50 <SEQ ID No.:0721;PRT;Methanopyrus kandleri>

LIIAFTGKGGTGKTLAALTVELELLDRHPDADLLVVDADPDANMPDVLGVEVDTTLGE
VREHFKREIEGGELPPGFDKQAYMEYLVMTALQESDDYDLLVMGRSEGKGCYCAV
NHWLRRVMRELLPNYDYVMDCEAGLEHISRGIIEGVDTVLTVDHSYKALRTAVRI
SRLIDELESDVGEMWVVANRVTEGEYAVIREKGEELGLRFAGFVRPDDEVRLHLH
5 GRPLTELPPDAKVRDMRAVLTRVGVLLSDG

<SEQ ID No.:0722;PRT;Methanopyrus kandleri>

MAEDKGVKNMLEHLVKNLLVEDVEEIELRNVITIELDELELDLKTVAQTL PVEIWERIL
KPEVEEKEREVEVEPEYEPPEVEEYEGCVAEVQIGATRSDGGSRD RVVVLGGERAYF
10 PFEEPRPNPPVWTFDVFDT PDVGIPGPIREELGDVIEDPVDWARTVVKRYGVDIVT
HLVSTSPKLHDAPVEEAMETLEDILDAVKVPPIVGGSGDPEKDV E VFKAAEVCEGE
RVMLSSINEDMDFERVVEAAKEHGHVLT FAPVDVNL MKSLNKKVLNRGLSKEDV
MDPTTCALGYGIEY TIDVMTRIRLAALKGDEHLQMPISSGSTNAWAAREAWMKEES
WGPREYRGPLWEAVTATTVALCGADLLMMFHPWAVQV VMEAMEYMAEGRVTGD
15 AYVTDVIA

<SEQ ID No.:0723;PRT;Methanopyrus kandleri>

VAQLSAMDVYNLLPKANCGACGCKTCMEFATKLVNREAKPEDCPKLDDDESLEKLQ
ELLAPPVKELTIGEGDREVT VGGDEV MFRHEL SFFNPPP VFVTVYDDMEEDEIAGKT
20 EEIQEFQVERVGEVLKLDGVAVVSRTGDPEKYARAVEIAVERSED LAVALITDPKV
MEAGLDVFDERPLLYPATEENVEDLAKLAADGDCPLGLHARDVEDLVPLVVEAQY
TDDLLDPGTEFGPHDVSTTDKLA EIRKAAIEEFESFGYPTLVTTFPYAFLEDDPVK
AARRESYLASACVLRYADILIMDTVEPWALLPVL TQRQCVYTDPREPQEVEPGLYRI
GDPDENSPVLVTTNFTLTYHCVAGDLESADIDCWLLVIDTGGLAVDVSVAGGQFTG
25 EAVKEVIEETDIEDKVEHRVLVIPGKAAAVKGDVEDATGWDVMIGTQDSSELPEFLE
KEGLLRIEE

<SEQ ID No.:0724;PRT;Methanopyrus kandleri>

LILVTGGAGFIGSHVVEELVDRGHDVWLDNFSVGCEENLREVRDDIEIVRADVTDP
30 RAVERTFREYRPEAVIHLAAQVNVRYSMESPFVDARINALGTLNLVSLAAEHDVERF
VYASSGGAVYGEPEYLPVDEEHPTRPISNYGVSKLAGEYYVRVYAERDGF EYVILR
YANVYGPRQDPRGEAGVIFLLRAARGEPLTIFGDGEQTRDFVFVEDVARVTAEAV
ERGDGVYNIGTGRET SVNDIVNAVKA VTGVDVEVVYEDPRPGEVRRRIYLDPSRARE
ELGFEP RVDLEEGIERTWEWIRRKIA

<SEQ ID No.:0725;PRT;Methanopyrus kandleri>

LPDVFVLV VAPDRCTDCRKCVNACERTHGHARIYKISEDAPPVTCLQCDDAPCANV
CPVNAIVEEGDSWIVTEDCVGCGLCAVACPF GAIEMVN GRADKCTLCVDAPKKVPA
35 CVEACDRGALKLVSKSQVAEEKRERFAIEMERIYRTLAKLESEEGSLRGESGSRG

<SEQ ID No.:0726;PRT;Methanopyrus kandleri>

VKVG VVGKGGVGKTTVAAALAKALTDVGYEVLAVDADPD PDLAYSLGLPESPTPIV
ERRELVRERTGAEPGTTYGPVFKVNPRVSDLPDELAVRVAPGLRLLVVGSVENPGE
40 GCFCPAAALARRLIRYIADRDES VVDTDAGLEHFGRRVLESVDWVVVVCEPSVK
SMKNARESVRLAREMGIERVALVKNKWREDAPEPDLDVDFELTVPYSDKLVELEME
45 GRPVWEDPVVRKAGEELARRLTR

<SEQ ID No.:0727;PRT;Methanopyrus kandleri>

MGGSGGEEGGRGAGKTSYEVVIREEHCKGCFLCSWVCPIDALKRSNRRNERGYLL
50 PEWNGECTGCRQCELICPD LAIEVREVEGDG

<SEQ ID No.:0728;PRT;Methanopyrus kandleri>

- MGKVDFLQGNEACAEGAIAAGCRFFAGYPITPSTEIAERMSARLPEVGGVYVQMED
EIASLAAVIGASWAGVKAMTATAGPGFSLMQEHMGYAVMAETPCVIVNVQRGGPS
TGQPTKASQSDVMQARWGSBGDYEIVALSPTVQEMYDLTIECFNWSERLRVPAV
LLTDEVVGHMRERVVLRDDVETVERELPPEGEEIEKPFPMEPDDLVPMPVFGRG
5 HRVHVTGLTHDERGYPATDDPEVHRKLVMLCNKVRKRAREIHEEVGYDFEERES
DVALVAYGGCARTVIEAAEELGVTVFRPKVVHPFDPDMIRDLLDGYEVLVEMNLG
QYVEMVERALDRECVHLLGYPGGYPTPERVIREVKKLSG
- <SEQ ID No.:0729;PRT;Methanopyrus kandleri>
10 VTVVDWKELVRWDRMPHILCPGCGNGTILNALVRVLAЕКFEEGELDPDKTVLVSGI
GCSSRLPGYVKLDSLHTTHGRPLAFATGIKLANPDLEVIVITGDGDAAGGNHLIHA
ARRNLDVTVICANNYIYGMTGGQVSPPTPRGAKSTTTPYGNPEPPFDLCELVMGAG
APHVERWTTAHPAQLKAAIARALEREFGFSFIDVLCQCPTNYGRRNDMRDPREMVE
WLRENTSTREEEGKIRIGILRDEEREPFHKRMYSMIEEVRTGEEGD
- 15 <SEQ ID No.:0730;PRT;Methanopyrus kandleri>
VRKEIRISGFGGQIVLAGVVLGRAAAVYEGYNAVQTQSYGPEARGGASRSDVIVS
DEEVMYPYVRRPDLVTMSQEAYEKYVGSVPEDGLVYDSTLVEPSREDVEHVG
20 PATELAEELGLRIVANMVILGALRELTGIVSFDLSLRKAVEDSVPPGTEDVNVRLKL
GAREVRE
- <SEQ ID No.:0731;PRT;Methanopyrus kandleri>
MIRLLEYQAKHLLKEAGVPIPEGDVARTSADAARIAELGGPVAVKAQVPVGARGKA
GGILFADDPEGARKAARKLLGSRIRGETVRKVLVEEKLDIAEEWYVSITLDRAKRRP
25 VLLVSREGGVDIEEVPDEKIARRYLDPIGLRPFEEAREALEAGIPKEHLRDVEEVITS
MYEVFESYDAHLVEINPLVLTENGEVVAADAVVNLDEDAANIRHPEFAETRDFFPV
ELDGDIGIIANGAGLTMATIDLVDLGGKPANFLDVGGGAYPTLIRRAITVAELDVKV
ILLNIFGGITRCDEVAEGIVQALDDVDVPLVRLVGTNEEEGHRILREHGVVDVYTELK
EAVERAVALAGA
- 30 <SEQ ID No.:0732;PRT;Methanopyrus kandleri>
LLDSDTRVLVQGITGRHGSFHTKLMLEYGTEIVAGVTPGRGGQEVHGVVPVYDTVEE
AVEETDAEASVIFVPAPQAPDAVMEAEAGLDPIVVITEHIPAHD TMRFVELARWEGI
RIIGPNTPGIIVPPERVKLGIMPHQVFTGEVAVASRSGTLTYEIVQAMTEAGLGQSL
35 CVGLGGDQIVGTTFIDFLEYVREDDRTEAVVLIGEIGGNAEELAAEYIAETDFPKPVV
AYIAGRHAPPGKRMGHAGAIERGRGTAESKIEAFRKAGVDVAEKWPVEPELLREYL
- <SEQ ID No.:0733;PRT;Methanopyrus kandleri>
40 LKLSVPGALTGFFHPQPGKTPKDTGSPGFGLAVDSVVIVRVRLRAERLRVRADHPI
DSRIARKCYEVLDPDGGLSVRYEFSVPPGCGLTSAASALGTLAGAAEIGLEVSPE
WIARRAYEIELELGTGIGDVVTIWHGGAVLRVGPYPDEVLIHRIPVEPDLRVLIYEP
RPIETREALDGLSGTEVALRYLKELERHPDLELALRRSLEFAERLGFSEEVKLAKELS
HKHLGASIAMLSRTVFAVSWEQDPQADVLPVSCSSFPEIISGISEIQCERGLRDV
- 45 <SEQ ID No.:0734;PRT;Methanopyrus kandleri>
MCEFTVKLGGEVIAEDVLYLEVTEEGVVLRDVMGEEQVIEGAQVKRIDMDEHVVEL
ER
- 50 <SEQ ID No.:0735;PRT;Methanopyrus kandleri>
VLEPDTRLIVALDVSPDRAVEIAETLDGYVDGFKVGYEVVLAEGAAGIERVAEVLEES
FLLVDLKTADIPEISRSIVERVSEAGANAAIVHGFVGPDVVEECAEVLVPFVVATMSH

PGAREFYDRACRDIVKACDDIDGVVGYVAPATRPVREVRKITDKLIASPGVGAQ
GAAPGDAVRAGADFEIVGRAITEAHDPVEAAKDLTRAMRTSRPAER

5 <SEQ ID No.:0736;PRT;Methanopyrus kandleri>
LGPELAAVSGFALKIADDLVDELSRPQWALPCGLVAAAAALASVATGVRPDLYLGLI
LGNAVAGKIDEIPHLAAAAIVALGVLTIRPEVTPLTLLVITVLATLDEIIHPVEPTGLRPV
LKIGAVVGWAFGVLDGITALAVITFDLGYHAAELLTGAIKCSNPIRA

10 <SEQ ID No.:0737;PRT;Methanopyrus kandleri>
VKRETFRYRGDMDLGFLREMERVGALGAGRLGRAARILEKMWSSDDVTVLLTVA
GPAVAGGLGELFERLIREGLVDAVITSGANVVHDALDALGGIHHVCLGERNVDGYGR
VHDTHIPTAEFEKFEHFMREVLSDLSGRVSCRELLWEMGKRLESGLRAAADEGVP
IYSPGILDSMVGLHVWIHSQDHDHDLVDDMHHLADLVFEAEELGAIILGGSVPKHF
15 AMGAAMLRGGLDYAVQITMDRPETGSLSGAPLEEGKSWEKVREDAEVATIVGDYLI
IFPLLASGVMQRLGIV

20 <SEQ ID No.:0738;PRT;Methanopyrus kandleri>
LWESRRKSEPRFPLSFSSDDVKSPDVAVVGLPRERVLPEYPTGQAEAPNAVRSA
STLDFYDPEVGDPLEILTLVDEGNLRTFEPESEPEIFVVLGGDHSITPEIVQELTPRRL
LWLD AHPDLRRSERHDGALRGCLEIVDEVFLVGVRCSWSREEYDVFREHEHVSVD
HGDITEVIDDVYVSLDLVDLPSVVPVGTTPPEPGLPYRLCADILRWAGRKRAHLD
VVELCPTVESHVSPVTAARLVGEYLKGVAER

25 <SEQ ID No.:0739;PRT;Methanopyrus kandleri>
LDVAVKKVEVRQLKKGKYIMIDDEPCKIVEYTTSSPGKHGSAKARIVAVGLFDGKKR
TLTKPVDKVDVPVIERKTAQVVSMDGDTVQLMDMETYETFEVQKPEDEELASQLE
PGTMVEYMEAAAGKRKIVGIKEE

30 <SEQ ID No.:0740;PRT;Methanopyrus kandleri>
LGVPKKYALVSGTGEADTSLAAFDAAIDAGIGDCNLVELSSILPPNAEEDDLPEFPP
GSIVPAVAKAVGRGLVSSCICVGRLESGLGIVSERAATDSVETVRRRLAKRDVEEMA
RLRGEKLVVVRTVTASTEPEDAEEWAAVAAVVFWG

35 <SEQ ID No.:0741;PRT;Methanopyrus kandleri>
VRETVEKIVKERVLPVSKVRRGWVEVGRGADGTPTMRVDEVAEREFLRGLLEEG
VDARVISEESGEMRVGEAPEVTLVLDPLDGSHNASRGLPFYCVSVGIADPEAETLD
DVEEGLVSELLTFGPGDVEEKPVVERPLVSAYYYGSDRMPVEFSRGRFKLRCLG
SVALELALVGKGALDGFVDVRGSLRPTDVAGAFGAARGELAFIFARNGRELDPSEIP
LRPDRFELATARSEDEARELFEALKEDVGIRVAQRLFGKHPEGLSEHALCGKLGE
40 ECCELAHAVGKEEGYGEELADV FALVMNLANELDVDVLTERRKFRRVFGCSDRR
SSV

45 <SEQ ID No.:0742;PRT;Methanopyrus kandleri>
MFRPQVVGVTGRTDLGRAVRVAERVCRLCDREGFEVLVDDSLGIGEYPRVNLKDM
GKEVDMITIGGDGTILRVSRITSEYEVPI LGVNLGKFGFLTEVSESGLKEAVSRLARG
DFNLEEHRKLRIKIGGSDEGDALNEVTVITSRPAKMIRYRLSIDGFELETTWADGVLV
ATPTGSTAYSLSAGGPIVEPQVECSIITPLNPFKLEARPMVVSMDRRVEIDVDDPER
AEVVVDGQEYMNLDGTVSVTRSPNVARFIRFGSTYFERLKEKFLRWD

50 <SEQ ID No.:0743;PRT;Methanopyrus kandleri>
LDPDLPTNVLEEILKKSARSADGVLGVRMSAKKEYYRVIESLSLALAELSVLAARHAG
RKT VKAEDVELAAATLDVISSIRDPRGRGGSRG

- 5 <SEQ ID No.:0744;PRT;Methanopyrus kandleri>
VLGGTQLTTYVLDTSALIKGVPELLDGPAYTVPEVIEELKDDLSRVRYEVASVRVKE
PEDWAVRRARRRAKVTGDLPRLSKTDLKVLAALIELMEEQDVVLVSSDYSVQNVAL
TLGIRVYGPVHGDEVIGPGGRRWRPSV
- 10 <SEQ ID No.:0745;PRT;Methanopyrus kandleri>
LETVGVTTVTVSGLTGSKRVAARVDTGAENDSIDKLASEIGAGPVIGVKKVRASAS
ASRLRSERRPVVHVTLELAGRCLPSEATLADRRDMRYPMIVGRKTLRRAGVTVDP
REEEPGDEVDPRRVGTCLKLHKRLLRTVGEKRAVTPAVLALQHGGAWSYRDGDV
SSVAVPIRKLSNGVREDLYLLLNPEIERAEGTLTRLEKCGRERVRRAKRRRLEV
RHDGGAIIRVDPGRRRIRVRELDPGTLRLEGIPAANLHHELHSHLMGDDLGPVLEFE
VE
- 15 <SEQ ID No.:0746;PRT;Methanopyrus kandleri>
VKGDTITVSETIRVATRSSLAIQTREVIELLERESPRDVEVEIVKTKSRGDVVRDRP
LHKLGEKGVFVKEVDRLVLEGKADIAVHSAKDVPVVDYPVDVAAPPRRDPRECL
VSRHGGKLKELPRGATVGTSSPRRRAQILLERPDCLKVEPMRGVNDTRVSKVRRREY
DAAVLAKVGLDRLGMTSEVSEVYDPEEFVPPAGQGALMITCRKDDDRVKRLLEV
20 DEKSRVEVETEKAVVRELGVGCSEPVGVHVRARDGDHVRVLVGLFEEDGSCGHVL
KMRGSPEDVVREAVSQAREVLSDG
- 25 <SEQ ID No.:0747;PRT;Methanopyrus kandleri>
MGELYLVGGGLSDVRDLTLRALEVLA SVELVLDVTYTSVYDVSEGDLKRLNNGFGG
DPEVRMCSRDLERFFDLCEGYDRVALLSPGDPMAATTHVALVVEAADRGWDVE
IINGVSVFATAAPSKSGLEMYRFGRTATIPNVRSVYPYDVLESNRQAGLHTLFLLEVA
EDGEFVSVADAARYLLEIEREEGRGVLDPSDLAIAVVRLGFEDLVAVGTLEELSD
WEPGEPPQALILPASRLREAEREYIRRVLPHIRDVRGV
- 30 <SEQ ID No.:0748;PRT;Methanopyrus kandleri>
LGEETGGDYHVLEAAWIVYNVDDDDAINIAIEAGKRLNRHGLDYVDIDVGFYEC
PECGNEIEGVWIVAGTALVRLILSMRVFNAESEEHAIRIAKYEIGQALEDVPLGVVEV
TPL
- 35 <SEQ ID No.:0749;PRT;Methanopyrus kandleri>
LYVVPYNTGEALLDFFVITHLTIPFALSYSSVTQVRVLSLSLFTLGLVALLFTVDAFSLF
LPVSRHEFTHPFGPLAALAAWATSRYLLQLLETRGITAARRTRPYFNLLWVYVGMVG
GIMHRDFLLSWFLCWALTEHFIKYLKVESRFRAFAARAAMSKRSIVMATLMAIGF
LGLLELLAYVLNKPVSPTLRIKRAEYTVPGLEFVAKNTHIIGHSTKALPAGYEWRG
40 FGDGFVTLPGVYLMMFRLDVPTLHGALVKKDLDYMLPGLFTWAFDFGYIGAVLL
SIWVAATLYVGSRCLESEYIKLRRRRMTARFLAREAMLFGLIAFSVQSLIGVFLFSRA
MNSFALATFTLLSALIWAHLVRGK
- 45 <SEQ ID No.:0750;PRT;Methanopyrus kandleri>
LIPLIALALVSGASATFNMIVITDPSGKDPNGAAAASMSFAPNMFQSTFLVSKKLHV
AVLAGGLSKGTARLEAILACIRALELGEDIESAVRAGISRSPTDRLLVGGPGKGVAVG
GSYDIAVVIVKGNKIIKQYHSSGGPNIVRIPKNVKCAVIHLRNTPGNPMYGTATKVRI
EAAIMAGRMIRDGLPATEIVTRIMGYVAKKSGEKYGGGVVNITAGLSTGDTFVPPKL
NARGIPMDTAYRKVCPKCGWSVAYPAASKYSRCPVCGSSLRTEYAWQVARDMITV
50 RKDQPIVRVYGIKSVYDKVSIVETVQTLVQAGKKQPEDIAAIDSDIDNNTLLGYDYIL
PGDVKVEPEANLITIYMRPLPEGYKKPPLKTPISPETLHSLGLISSAVGVALIVLGGIRE
LVNRRRLRAW

<SEQ ID No.:0751;PRT;Methanopyrus kandleri>
VEEERKRKWIKPWPVSRRNLAIMLMGALLSIGRIA EYTAWAARPVPKQEGLRIIGID
VVGCDLPEEVIRSNVMASGLRPGSVIKGGTLITPEGKKIPLHEAIRRARIYAMRSVIP
5 GTKIKPIRSVQITIKRSGVVVVRVIEDYGLPR

<SEQ ID No.:0752;PRT;Methanopyrus kandleri>
LKLTVRELAENVEGEIRSGDPDSMIAGWFSTLGRAKEGDVVIRWWLDDKGAEIASE
RGVACLVT EHPRGKLIERCDELGIPLILTEVDRANEYALRVAREKCAPDATAICVTGT
10 NGKSTTNHLLHHILDTAGFDAYCNTDFRSEKNTLIDPVVAMELREERPEDYLCVEVS
EVQGLPTGRIMEDHAYRMAKALKCELAVTNGVDHTNLVSSLEEMVDAVYGVVR
ALRKGGIAVLNRDDRYVRMTREGVETVWYGWDEGYSHIEERDGEWIVLDEEPLI
PVREFPLPVDHFLYNALA AAVAAGALGIDREDIAEGLRTYQPLKRRFERLCDDPLIYD
DFCHNPDGVLATVRALRRLGRSKVIVVFAIRGSRGVDINRQIARALAEAGAKDLQDEG
15 IHVHV IATSSEGLVDDANVVRPEERRAFLEELERSGIDYEHYDRLEDALERALDLAD
DDTVILLGGAQGM EPAREVLRDMGAI

<SEQ ID No.:0753;PRT;Methanopyrus kandleri>
MIIETFTLSTVTS AVTVGLLRKYMREANVDRPIVTEHAHKSGMPIMGGLGILLGTAS
20 GPLLASIQALPPIASALPMMVLGIVDDLLGLQVEEFQKVVRNVSNRPIELGRILQPG
EEARVATEKAKRDLKRILEEDPDAIEIVGEVPIKKELSEREKLALQTGAALFVLPVPA
TWLWIPKVG VWNLSYLFYPVAVFGIVGATNAVN LIDGMDGLAAGLLFLASLACSGVC
LGQGQLPGA AFFASLAGASLGFLFHNRYPAKIFMGDTGSCFLGAAYAAGALYYKIEI
PAMIALGVPV LSTLISLLHRAGVIRLAVEPLHHHIQYKYDLPEPVVALHWTAGAVFA
25 AVALWISVG

<SEQ ID No.:0754;PRT;Methanopyrus kandleri>
VKVLFVGARLLRDVAEYAGSTGVYRILTESNPRSRDWELADEVHFVPRGMEHPTRI
ARERHVDGVVPLIGVDDPLPAVGEMKEELEAE GIRVVASDRESVEIGIDKVRTKRAF
30 EELNVPTPEWEVVENERPSISPPVVVKDPRSQAGLGVT VHETHKPRVSGRKLVEEF
IEGAEVSIEVLSWDGEV VPLVPVFKGSTADRRHPIDRMSPAPIDPSVERKIRCA
VRVVEHLGLEGNVDFDVVRENEFWFLEFNPRPSGTRYMTSGCTGIWPLRELVD M
AADRW RPPKIRKLWCAIECPVWRPTDKDPLREMFDDGGVYHV FYEYYGRFDVGG R
VTVRGDSFKEALTRLRSALKAAGADV KRAEREYRRRLREIEEYL

35 <SEQ ID No.:0755;PRT;Methanopyrus kandleri>
LAELPWSTVLVIGVCGPVCNLAARVLAERGYDV IASDLRDECEFAETLLEYSNVELV
LGGHPPEIFERA EVVPPPSLSRDAKPYRLAEDHGCEIVEVKELLDM LPPTRPVIGV
GGTNGKTTT VAMIRHVCEQLGLEAPHHGLPGMQGNVGLLPPLQARLP GDVSVLEIA
40 TFGKRGEILEAAELSQVECVCVTNITPDHLNEAGDFTYARCEAE LLEPDTIELAVLN
AQDPLVVGAP EVVDFNGDIVYGLDVEPFDTSEKECWCGGHVEVHEILPWVGPFK
CRECGLRSPEPDY LATDVDLSGFRLICPDGEYEVRLPVMGLHNAYNALAAI AVCSEF
LGLDVEDVVEALQS FEGVEGRLEVLDGGERVILDYGHNPAGVDATLRCVKEAY
RERRVCAVIAVASELGPEGDEEILRRAADLADLVV VASYAAYEVM DRV DADNVIAAE
45 SATKPF EKKGTLGASREQVLDGLKEALRSDCEVVVLFGEAPLKYREEISEEVERVLG
DER

<SEQ ID No.:0756;PRT;Methanopyrus kandleri>
MTSPPPSSIALSGGKDSVATLIDAADRWNVKVAVTVVHEFTDKTCLENARKAAEHVG
50 VDHEVVKLRLREW FARALKEGRPICTKCGRSVLTAACLRARELG CATVLTGHEL RG
KFGRRTHPHYPPGVTVVRYPALRRWTWEDIRDIVSSLGWFNPEYTCPIRPYGVHRF
IEEVGYNPLTGR ACTIMLEGVATPQEALAYLRETETPEEDPERVLDILGLEEKAAFPN

GIPDGPRDEDEIIRDLTyrLLMYARQALRSLVRGTLNRRVERRERFTQLYFVMSEYGK
IDDRVEHLDieAFVRLATGDREEAERLLRDVKLMRSILAEYGRTIPGARP

5 <SEQ ID No.:0757;PRT;Methanopyrus kandleri>
VEEKELRDLVRRYALENAARYGGRANPNVMMKKIMKEHEELRPRAKEVLKTVREVV
REVNKMSGEEIRRELEELGGPREDVARDKEGLKPLPGAEPGNVRLRFAPNPSGPL
HIGHARAAVLNDEYARRYDGTLLVRIEDTDPRRVDPEAYDMIEEDLEWLGVNIDERY
VQSNRIELYMVCCELLEREGAYVCTCDPDEFRRRLRDVGRACPCRSRDKEENLEL
10 WEEMLDGTFSEGEAVVRVKTEVDHPDPAVREWIAFRIVEEEHPMTGSRYLWVPTM
NFAVAVDHLMNITHVLRGKDHESENTRRQKYVFEHLGWDTPYVHYGILKVEGAVL
STSEIRRGIDSGEYTGWDDVRVATLRALRRRGIKPEAIRETILEIGLTDVATFSWEH
LYARNRK MIDPESHRYFFVRDPVELRIEGMKESVLARLPLHPDRDEGERVLILHPEN
GVARALLDGEDAEDLWEGDVVRLMNAVNVIEEVDGWLRGRYHSDDYRIAKEEG
15 AQIVHWVPPDQAVRCEVVRPDGVSVEGYAEINVEREQAGSTVQFERLYFVRLEEV
SSGGVRAVYAHD

20 <SEQ ID No.:0758;PRT;Methanopyrus kandleri>
LAEETTPRDPFSVTIRTIRTSIRDAISSVYEDELIEVPIDENPPVEGADLATPVALSLA
KELDENPRELAETIVEESDLDDVVFVEKAWVEGPGFINLKLDRSQYAALTLRSIFYYG
EEYGSLDLGMGRP VILEHTSANPNGPLHIGHGRNAVIGDILARCMVFTNYGVEVQY
YVNDMGKQIAMLAWKYIKEGRPEVPEGEKPDFFGKLYTEAAREIEEDPELEEVE
RFLRSYERYLVEEESRAERIADAFQTVVEECLRGHIQTLERLRVAHDRFVYESEFAR
DALEIVEKLLDMGVAEEREDGAVVDLEDYGIDKELVLRSDGTTLYTRDIAYHLW
KLGRATFVVDVLGADHKLAVEQLRAVLDMLEENPDRIIDVVFYEFIHLPESMSTRKG
25 RYVTLDEFLEEAKKRALEKMKAAAGVAEELSDEEREKIAEEIAIGAVRFARVSPNKP
EFDWDEALDFRRGGPFIQYAYARAKSILRKADDEEVNRFDAAYLNDDHSFELILKMSK
FPRHVAQCVRKRPRDILA EYAYDLAKTFHTFYEEVPVLHVEDDEVREARLKLVEAFT
IVAENLMNLLGIPTLERM

30 <SEQ ID No.:0759;PRT;Methanopyrus kandleri>
MAESSTVERYRFRKMIERLENLRGQGTELITIIYPENRLSDVIAQMREEYSQASNIK
SKRTRKNVQSAIEVVMQRLKMOVGETPENGLVVLVGTVDGTKEKMVAELIEPPEPV
DRFIYRCD SKFYLEPLKEYLEEKDVYGILVMDRREATIGLVKGKRIEVPKRLTSDVPG
KHKAGGQSQRFRDLIEHAAHEFYQKVGEAAREAFEDVKDLKGIIVGGPGPTKEEF
35 LDGDYLPKDLKEKVLTVVDVGNTDESGLREALNKAEEALKEAELVREKRLVRKFME
EAVNGELAAYGEEVDELLKMGAVEVLLVSEDLEGYKVILRCPECGYENIVTVKEKDE
AKKYVEECPECGEAELNVEEIKDIVDYVELAEQMGSNVEIISTETEEGAQFYNAFR
GLGALLRFRPK

40 <SEQ ID No.:0760;PRT;Methanopyrus kandleri>
MYSVALGGSVVNVDPKPERIKETAELRNGLDSGLKICVVVGGGPTARRYINVARNL
GTPETLLDEMGIAVTRLNAMLLGAALGLHDLHVPETPVEAARIVRRNGVAVCGGTH
PGHTTDAVAAMIAELLEGLVIVTNVDGVYDKDPSEPGARKLREL RP EELEELAVRA
45 ELKAGGSFVVDPLAAKMISRGQIVTHVVSWE DFRSRGLENVVRGRHNGTII EG

<SEQ ID No.:0761;PRT;Methanopyrus kandleri>
LTERVPPHSHCIVCGAAIPEG ERF CSEKCRM EYERRR KKAATLQWMLAGALIALGV
VLM LRGV

50 <SEQ ID No.:0762;PRT;Methanopyrus kandleri>
MIKTIRTPVGEFKLLVDSYQLDLLRDVRRVVFVFTSMVAEVAEDTFADLGAGTGPLSV
VAAHAGAERVI AVEKNPKRARLLEKNLRKHVPHDVEWEVVG DARDVDVNADVVA

CEMIDTLLLEEKFPVINAVLERYEPTIVPQEVRIKANPIRRPPRTPRYRPGLPEDIEP
LEVIRTDKPIPKKFYEYETPEPGYAFFTWVEYEGTIAGGSDVFCPVLELPTPGDVLIGV
RGAGLPSLRSYTPEHQDHT

5 <SEQ ID No.:0763;PRT;Methanopyrus kandleri>
LLDTVKDYMSGVIKRAKRGNDIAMLIDGPNMLRKEFDVSLKEVRELVEELGNIRV
GLAFLNQYASDKLIEAVANQGFVPRVIPGDVDVYLAVEAMELIYSDNVDAIALMTRDT
DFLPIIAKAKEQGKVTIVIGADPGFSTALQNAADYVIKLPKERESEEGKEEKPEEAK
DVVSDE

10 <SEQ ID No.:0764;PRT;Methanopyrus kandleri>
MKRRWKLYSRVVRELIAEGKNDRVAAALALEGYRRPPGGDRVHDDIVTLIKTERGL
EGASLHPEKCLRLREILGLKLKEVWRRFQEPQARSAALDAVASAENVEPEEEISLPR
DYGRAVTLRAKIVADTAEKLGDEVILVGSAHIARELDRGILLQIVDEDPRLRVERNI
15 KFGESVLLSTGMVLSNGSVRRFLASHKGPVVLVSQSCPHLTAVLTRQGVVDAAVVE
EFPYHFSPGGECKLRVYEPERPAR

<SEQ ID No.:0765;PRT;Methanopyrus kandleri>
LSELMVDVHLLSHKVPERRLEKEVSEALRRAGFDVLSVRATRGSDIVGAFAVEY
20 VILVDVRGEGDPEGPVKRALRDYGRVEVQVGSRSRSGSGECDEEALFEGSKGAD
SGG

<SEQ ID No.:0766;PRT;Methanopyrus kandleri>
MKELMGVEPQTEGQERLVEALLNEENEIVAVFGPTGTGKTLFCAAYGVQAVMEGE
25 YDRFIVTRPLVDVATKQEMSSADLPEKFEEMVVTVMVDVLSRFTGRDELQQLVDEG
KIMIVDTHFVRGRFTDDAVILLDEVQNMLPENAGEVLARMGHNSRLITGDPVLQKD
VDIDRCGATVMREVLAEPEKAEVVDLGTDRDIVRPGAERGVLHLQLEIRVRNREMNDV
EREIMDVVQVEAPDADVLTVLYVEPIAEDLEIKTENVPQAVIVTKEGHVGRVVGTTGG
ERIERIEAETNMRIVVTHLTLDVDFDIADHPVPWIGERIVDVIAGPNLKVWIDQKDF
30 GPFGMGQRGRYARYVEEVLQELLGMGLEVEQA

<SEQ ID No.:0767;PRT;Methanopyrus kandleri>
LKRVTVGNSRRVLRQAVRVSLKPVYKMYERILEEKVKEGRVPEHVGIIMDGNRRFA
RELGLEPWEGHRYGADKLEDVLEWCLDLGVKAVTVYALSTENLNRPKELKRLFDL
35 MEERFKALAESERIHRRKVAVRAVGRHLPLPTRVRRRAIKKAERATKEYKDRFLNVA
AYGGRQEIIDAVREIAHDVKVGRDPDEIDEGTFRKYVYVGDLPDELIIRTSGEERL
SNFLLWYSAYSSELYFVDVYWPEFRKIDLLRAIREFQKRERRFGR

<SEQ ID No.:0768;PRT;Methanopyrus kandleri>
40 MMIGILSDTHDNLKAIERLASSELNEADVVLHAGDYVAPFTLPVLAKVECDEFIGVF
GNNDGERDYLREKAEVGFELVGEIFTGEVLGLRVAMIHGTEEA VVEALARCGEYD
LVVYGHTHEPEERVVGDTLVVNPGEVCGYVTGRRTAALLDPDEKKVEFVEF

<SEQ ID No.:0769;PRT;Methanopyrus kandleri>
45 LAALRTPVRRYTLRVNTLKADLEDVVECLASDFPDREVRESPYSEYAVEIEVKGPYP
VEGNHHVVVADKFAAESVYVGADLYAPGVVQADPDIRRGDRVTVVSERGHPVASG
EAALQGREMEKDRGTAVRVD RPTFSAPKVRETEAYRRGWVYSQGLPSILAVEAL
SPEPGETVVDLCAAPGGKCSHVAQITGPESKIVADR SAPRLERMEARLRLRGIDWV
ETVHGDARKVVRRLRG TADVVLVDPPCTALGVRPKLWVEATYEEALGLPSYQYSL
50 RAGYEVLKEGGRLYSTCTLTPTENELVVERAIRELNLEPETVPLRPARRSGPGVVF
LPHRADVPGFFYAVLVKEG

- <SEQ ID No.:0770;PRT;Methanopyrus kandleri>
VKRRAIPAMAAGVAVVLIMIWSFDPRKVLTVIARTEPRLFALAVCIQLVDLLLWALRW
HLVLRGGVKAPFRLVFAVNNVSMVLNNITPSARSGGEPLRVYLLARMTRYRARDI
ASSVVIDRVL DYFPLTLLLLSAFLIAGSGGRGGILVILLGGVSFLTAAILSLWFLASE
5 RYVHRVARGVLRLLSRVSRVRARRLWEELDEWVERFVKQLRELLQDRLTLIQGTL
LSAAVWGCEILRTYVFLSLGREVPLPVIVVSFTVSMFAGVLP LLPGGGLGLVEISTAS
VYRLWGIDPGTSAAVALLDRLISYWMVNAIGVISLLRISRER
- <SEQ ID No.:0771;PRT;Methanopyrus kandleri>
10 LIFKKRKGGKRERPEIDLKLPPEEGEGAPKLKLPKPEGRPGESKGAEAVPKLKLKP
PKPSEKPPSGEEEEKKKEERPPAEIKPPKPPEERTAPSNLEAELERLKAENKKLREE
LDEWRNKAksamGERDRLRSEIKRLKEELEKQEKELDKYIKISKQLKEKLEKAKRES
EELKEKAEEYRERYEKIAGKYNELKSKLEDLSDQNRRLAENLKKLKEYNEIKEERD
15 RLKEETKEVGKLDQLAKLQSKLKEVKSERDDLANEVEALRNENEKLRKKIDKLKSE
LSNLQKKLKDREKKLEKARQHIGKLREEIKRRDEEIRKLKAQSKLKDEIKRYEEGKR
LLVPPETEMAIKVKGSIVIGKNSMVKALQEDEPIVVKEEINVKDNSRIYGTIVAKNISI
GSNVKIYGNVICENKLEIGEGSTVKGHVISINSLKTSADVIEGSMVSGDDISLANNVE
VKEVLITPGSVKASQGLSVAAVLCNDFESAGSIEADYILADERVKLGDDSFVKTIVIR
20 EGPVEQGVNSCVYYGSLSIKGRNPPLYINTEPFDDP VANRVFRKTISNVERLGPFHL
AKSEKDAKFVLRVTKMDIAEIVKELRESLKV
- <SEQ ID No.:0772;PRT;Methanopyrus kandleri>
VGIEVKEIRPGRGRPELVYARAELVVHKESSLKATLIGREGSTIREIGKRARELLEERV
GKPFYLDLTVVDPKRSPTNRWFKVRDSSEAWLCPAFKHPHLVSVRESRIRGNAR
25 VAAFVELEHVT VHGGAMISNFSSIRRSVLHKRVSVSSHCEIERSELGPVTFVGDGAE
IHGCKIEERC FVGMNARLSRCEIGRWSVVGAGAHISDSRVPERSLVGNSIVDRLDV
YTLVVGKRLKLELNGGEIWSGQGEKYYYCYLPEDNRITVRPEPTERVLCEVRKAND
KWEVRGEGFVRTVRGSSSLHWYVGHERGLLG
- <SEQ ID No.:0773;PRT;Methanopyrus kandleri>
30 LALPRIYVETDEV PESGKILLTDPEFEVIVRSRELAEKIAEELDEPIFYEQVVYEEARS
VFDVPEAKVTRHVIEPVDRRSLVFLKPGDRVYQIPVEGYVVTPIADVGDRLRKGD
LAAVTTRSGNVRYVEAPQDCLVVYVCEQPAIRTQRRPNYEEYIAPTE
- <SEQ ID No.:0774;PRT;Methanopyrus kandleri>
35 MRSEILKELNRARELVDAKIEEVLPRGGPEDLYDACWHLIEAGGKRIRPLLAIKSCLM
LGGSEEDVLPEAVAVELIHTFTLIHDDIMDEDDERRGVP AVHVKWGV PVAIAGDTL
FSKA FEVAAEGGDVEAVKELARACTEICEGQAMDIGFENRTEVTEDEFLEMIRKKT
ALIRTSCVVGGLKAGANREQLEALREYGENLGIAFQIQDDVLDLVGDESELGKPVGS
40 DIVEGKKT LIVIKGLELADEEQRRERILSVLGNEDASREDVREVIQILEDLG AIDYAKKR
AREYADRAKAALREL PENEHREFLEKLAD FVVEREF
- <SEQ ID No.:0775;PRT;Methanopyrus kandleri>
45 VEPLTVEVFAVGGYGEAGGRNMTAVRVDEEIVIFDCGMSLDKSLVFÉKDFQKASAR
ELRRVKAIPNDPILRPHRSKTVA AVL SHAHLDHIGAVPKLLFKYKCPVFGTEFTIELVK
ADLRNEIRYADEAEDIMINLYTVEPGDEVQISSKRLREFIPISHSIPCCVLPVLHTPYGA
IVYACDFKFDDNQIIGYKPDYKRLKQLGKEGVLLITESLRVAEEIKTPSESVAREMV
NDVLRFADEESEGII VTT FSSHIERIQAIADTADRLGRKVILAGRSMGKYGRIAEELGL
50 LNL PAGARIYDRPETIRRG LERANKEKEDYLLIVTGHQGE PGAVLPRIVDGELPYRLT
EEDSVVFSSTIPSPINRANRYVLDTKLRLKGVKMF KD VHVSGHAGREDHRLMLRM
LQPEFIVPAHGDPDMLAAYAELATQEGYEVNRDVFIMFDGTKLSLPL

<SEQ ID No.:0776;PRT;Methanopyrus kandleri>

LVRGSRAEGMRERKWEHVLACIWEDVESEESPLFDCVKIVHRALPELDFDDVDMEI
ELFGKRLSFPLIIAGMTGGHPKTGEINRKLARVARELEIGIGVGSQRAGVKDPEVRW
TFEVVREEYPDGLVLANIGLPQLRENGPDALAEVDMVDADALAVHVNVLQEAQVL
5 EGEADAAGFVDVLAEVCETVDVPVVLKETGAGVSAEDAKLVRDIVDGIDVGGAGGT
NWAVVEAVRSKAHGEIPLGYAFSDWGVPTAASILEVRSVVGNDLAIIGTGGVVRTGM
DVAKVLALGADCAGMALPVLRLKVLAEVVRGCVRFLLKSIAREVKIAMLMAGCSSVEE
MSSVPIVYVKLREWLECRGVPLDLVCTGDRRTGWNR

<SEQ ID No.:0777;PRT;Methanopyrus kandleri>

VFTVLKLGGSVITDKSKPKTAREDRIIRLMKVISDWRGDLVLIHGGGSFGHYAASRV
SDLQKGVSEVRRAMHELLSIVEKVAVDSGVRVYPVTPATVLYSLNVLDLLERGCV
PLLYGDVVPDHDGDGFRIMSGDEIAERVS WLGPDRVGF GMSVDGVYPRTPPEEGEP
15 LRELSPDEARDLARQLEGSAGVDVTGGIAEKLRRARIAERGAEVYMF DARDPENV
DRFLRGEHVGRITR

<SEQ ID No.:0778;PRT;Methanopyrus kandleri>

MKPVTLIRPSGEVTAKSAPVRKTLGELARRLERRLGEVVRVRGPRLIVPGHHPNAA
SEFGVEGALPGYKVRPKPATILKATRRALRECPEEIRVDVRSHHDGVS GHALFESV
20 REIVESTGRKTSKRGSRLLVEVYPDVA YVCGPEKAGPGGLPVGTQGRALCLLSGGF
DSPVATWMVMRRGLECKGLHFLVTESELEAARENERVLRRWCPDFDLLVDESHRE
FLETAERLTGRLKRYLCVVCKMRMLERASQWADRLGCD CIVTGDSL GQVASQTV
WNLKLEESQVNGIVLRPLVGLNKPEIVRYGRRIGVPERDPGRCPFVPERLIVKPRKR
EALRAYREVIKG

<SEQ ID No.:0779;PRT;Methanopyrus kandleri>

LREEVASSPQGLGLEILAKHKVSDFVRHGAIAVKPDEPLWNALKAMVTHGIHGAAV
MEDSKI VGA FEEDDLLRALLEEDALAAEVKRFMKPAVVVKSSDTFQNAMVEMLK
GNTTTRAFVRSSGLLRSGVYGVISASDIVRVLTGDYRGFRAPGNTDRPVSPPKVGDIF
30 WPGSVAIKQVIRNSPLTLDASSSVADVARCISEKGRHYAVLLEGESPIGRAGDKDVM
GAALDAILNRRDLHDLTARNYLQEMVVVPETPLHEALWEVIDKMSDRIYVMDGRK
LTGVVPLIDAVYTLAKVASD

<SEQ ID No.:0780;PRT;Methanopyrus kandleri>

LVDLDCCVVC GDSPE SIVDEVERLGDRADFGIVFFHDIDPEDVVS ELSYGVERFVG
CVAGEGHYPG SVK GHKISLLALKTEWMAKFGTGGSARQDPGEASRGAL EEA FEDL
DFDPYDVSY SALNLKDPKRIVMYRPVIGITFIEGATFHNLGGTGLEVL SGFRFGSGPA
AESIRTFGALSSDPELESAPVVC DKGVFESGAVYATISTFLKVSWSFASSLKPVTKL
40 GTVTKSRENVIVEIDGRP AGEVYIEKLEEVTDYVKACPNEYVYKELPPLGVVRV FPS
VGHRIIPRTPLEVTD D YIRTAGYVVEGEQLLLL GFDDRP NAPVRAYQGSLS SGEEPL
ASILVTFAGRKPLKEEIPDKHCVGMYSFG EII PITGYNEFH NHVSACLTIFREP VFD

<SEQ ID No.:0781;PRT;Methanopyrus kandleri>

LRDVIRGRAWVFGDDIDTDQIIPGRYLTTQDPEELAKHVMEGADPEFPEKVREGDVI
45 VAGKNFGCGSSREHAPIALKAAGIACVVTRSFARIFYRNAINLGLPLVVC PGVDDAF
EDGQGIEVNLREGYVRNLDTGEELEAKPLPDFMMRILEAGGLVELIKREGPRAFEG

<SEQ ID No.:0782;PRT;Methanopyrus kandleri>

VAYKIAVIPGDGIGPEVIEAALHVIEPLIDAEFVEGEAGDECAEKHGDPLPEDTLELCH
50 EADAILFGAAGETAADVIVRLRQELDL YANIRPVRGFPGLRELTGEPYVRDDVDFVIV
RENTEGLYSIEGRFRDTAYTLRIITEEGTRRIA EVACDLAEERGSNTVTCVHKANV
MRETCGLFREVC KEVVESRGLEFE EYV DAAAMFMITEPERFDVVVTPNMFGDILS

DEAAALVGGGLGLAPSGNVGDRHGLFEPVHGSAPDIAGKGIANPFATILSAVMMLEW
LGEDEAAEAVREAVGEAIREGVVTPDLGGDKKTMEVAEFVREAALNRVQ

<SEQ ID No.:0783;PRT;Methanopyrus kandleri>

5 MMSIKMTIGATGAAEAASHGDVIVVVDVNTSSAAEVALREGAVAVVGAAPDSAYR
VLSGEHAAKYPFAETPEGVDPVERGREAGKIAVEEGCDVVLVVDGGEDNASLARK
GVEDVGAEIREVVPNAGPRIKDVDPAGKVFLFATATGGTLYDVAKTHGAPAVTFG
TVVRRSFTRACVERALRLAGRYGAGVTIVVSSIFAPEDLDAGARIFEEACKVITESVC
EERFEDVVSRL

10 <SEQ ID No.:0784;PRT;Methanopyrus kandleri>

VDRYPDENG YFGEYGGRFVPETLMPALEELED A FKEAREDPEFWEELEELWRKYA
GRPTPLY YARNLSRKLGKVYLKREDLVHGGAHKLNNTLGQALLADRMGKDRIIAE
TGAGQHGLATAMAGAALGKKVEIYMG AIDVERQKHNVFRMELMGAKVHPVKAGTQ
15 TLKDAINEALRDWITNLETTHYLLGSVVGPHYPWIVREFQRVIGRETKEQITELEGG
LPDAIVACTGGGSNSIGIFYDFLDDEEVALYAVEAGGKGLDTDEHSASLCAGEVGV
HGCRTKVLQDEHGQIRPTHSIAPGLDYPGVGP ELAFLVDEGRVTADAVTDEEALRG
FVMLNETEGILPALESAHAVYYVKKLVERGELDRGDVVVNLSGRGDKDVRIAAEEL
GVEI

20 <SEQ ID No.:0785;PRT;Methanopyrus kandleri>

LDELIKDLEEGAGEK GELLAEIVYERADSLEEMLELLED MGMEGIKVD FVGDKEDPE
EIVITVETT VTFEYEE NPEVKEEMGFTEPACELEQALFRKLAELKYDKSMEIETKC
QLAGDDICKFRIVPKE

25 <SEQ ID No.:0786;PRT;Methanopyrus kandleri>

LKYFKRLSDRERAI FEAGITLGA IYHQFCGTPVSPGTAE EVAKCIERAALLQPCVIDA
RVEVDVSS EDDTNYGGYTEVSGRNLRVTIVTRCGEWEAVGKLEFIEELNYPLMWVE
EIRRVEQ

30 <SEQ ID No.:0787;PRT;Methanopyrus kandleri>

VTVIGIAADFDPPH RGHAYLLDRARDLGDEVVFLNADYTAHHTPPLL PYRLRREIVL
ELGADEVIPVRGYHQRFPLAYTVPVRVRLMAEEGVDVILDAGPSRNLDR LREHVER
VLEVSDLFSIPP NVPARNVWRWLA AVEYVNRELGT DVELLIP ELEGYSGRKIRAALR
35 RSGYSPDSL RKVRRHLPRET FKKLERYLKARTPPIARRKELLDV LNRASSYELCSIA
HLNTIAVREILRGR PFRSERQVWGALRRADYGSVLTRLALANTECRVTSDEIARIALS
WCVERLVPENQSPDS MYRRDWFVAALSSHGVKARDADR LYKRADSYEEARRLAR
RRYGVDPGVPRFETLIGEARVSDGEYRPAISANGRLGVVEDG FQELRATAFGATLL
RYVLDDPFVD A VIRVEDEEARLIVFP GDSP

40 <SEQ ID No.:0788;PRT;Methanopyrus kandleri>

VRRIW FHLDSKNRYSLAHVLGAVEARAPELIPYIEVSRNPDPEPGDIVVFSFNTFMA
PEVFEEVERLHDDVVKLAGGPHPSARPDQC LEHGFDIVLIGEGEEV VPEVLRELIRG
KEPEERPGVYLGEGNPQAPRVEDLDRFP PYSEGFRIFCSVEITRGCPWGC AFCQ
45 VTRLFGPKLRHRSVEDVVRWVRRGVERYGHTFARFVAPDALAYGSPDGIRLKPDR
VKRLLRSLRSIEGLEKVFFGSFPAELRPDSIAKGD AIELIAHYADNERV NIGAQSSE
RVLKRIERGHTVEDVEVAVEKALEVGLKPVVDFIFGLPGETEEDQLASVELARWIIKR
GGEVRLHYFMPLPGTPLENEEPAPLSSKIR RILGRWTQEGKAEGAWGHQMRLSKT
AMKVLSG

50 <SEQ ID No.:0789;PRT;Methanopyrus kandleri>

5 VGTPDEALQDRDESPERVMELEVLVLSAALYRRTVKALRDLTGFAREVVGLEEF
VGIVENPREYVRWLAKRVDEGTAEDALLTLVGGSGALVVRVGGDTYHVLIGPAYRS
EESVKAALAHELAHLQHLKLPKDVPRPAGAVRSVLLPLEVGAEELVLRPEIG
EVRIRMAQEEAREWRRTGDPILDLENALVAVPIRLAARRLGLDTSVQEPSIEDPELR
EVKEELVKLARGVDPWDQSDVERYTRKSVSILLDWLLDQDRHHSTSDSNNRKPS
EFRRR

10 <SEQ ID No.:0790;PRT;Methanopyrus kandleri>
LVRVAVIRFPGTNCDEMAWAVKLAGGDPEFVWHEDGGLDDFDAVIIPGGFTYGDY
IRAGAIAALSPILEEIRECAEDGRPVLGVCNGMQILAEALIPGTLTVNVGNRFICDWV
YLRVERTDTPFTTKYQEDEVIRVPIAHAEGRYYYENPEEIEDNVVFRFCGPDGDVSE
EYNLNGSVGGITGVVNDGDNVLGMMPHPERAAHRLLSDDGLRFLFESLVEWCRS

15 <SEQ ID No.:0791;PRT;Methanopyrus kandleri>
VTQLVTVEVRVSLKPKALDPEGETVKRALHRLGYEEVEDVRTAKIYRIELDINDEEEA
VELVDEMCRLLANPVVEDYEIEVVE

20 <SEQ ID No.:0792;PRT;Methanopyrus kandleri>
MERGRLVYEGKAKSLYEHPEDENLLVMEFRDDITAFNMEKMDTVEGKGVYNCLISA
RLFVLEDAGIPHTHYVELADERRMVVERLDMFNLEVICRNMATGSLVERLPFEEGEK
LDPPIVEFDYKSDEYGDPMVNMMDHIRALGLATEEEVERMRELTQVNEVLSEFLKD
CDIILVDFKLEFGVNPDPGEVVVGDEISPDTCRFWDAAETEEESLKDIFRKDEGDVLAG
YREAAERILRGDEEKLAMPLG

25 <SEQ ID No.:0793;PRT;Methanopyrus kandleri>
MPFLLEGARQLKTIEVGVAYGKDPHAVVEDAIDQLTEDPNLGLVFFSPKHIEEIESAV
GSLPEGCKVIGCSTAGELTPDGYTYGTIVVALISSPYLAVETHRITFEREDPKHAREI
GRNLVLGAMEKLRNPGPCLDINFNAMLTSLSEGRPIRALPYFIIELVEGLVPAIDYYM
DGINEVVQKYKFLEVYGGAGDDLRLERTYVLEGRITLCPEGSAAVAFGSTALKIGG
30 ALECGFEPVYEDRFPVTKAVPEERRIVEFDGEPAADYYADVVGKPEELDDSVFM
WNPLGWEIFGREIIVREPAFVEDDGSMIFHSRSPAAGALIRLEPTENMRETARRVT
ERAMRRADIRDPEEIALVLVFDCAHRDCDAQYDAIREVVGDDVPIVGFKTYGEHGQ
LESGPVGHFNQTIEVVDR

35 <SEQ ID No.:0794;PRT;Methanopyrus kandleri>
LTSTSVVIVSREITKGVSEIRVGLVIHGPTVIDTGWAERILRSLKRLGEVRAKLGTTG
YVALLDAGLDSVVEFDRKLPSECLSELNEWADVLVLTNHGKSRESGLAFAEQVLSR
AEGVDSLVAERPGEPPGGIVLWNPGBAERTVAEHLREDLGLKITEVVRTVTEKGG
GIGKSRRVACVEPGDRILVNGITVGVAESRNVELVFDDSGYLVEIRGGRIKPEGVER
40 LGRVDPERVVKTDRRLRTERPERKRVKSGPERIHRVLLVDHDAERKVEDMRRSD
AVSVGGDDTTCVCAELGDLGVWVIGLVLDLPDGDWVRDDTRESLRSENLAALLV
CERDDDAGKLVRGRFFRDREMRVLDPPPTVGELVEEVKECVKEVLKCVYHKAKET
SA

45 <SEQ ID No.:0795;PRT;Methanopyrus kandleri>
LNLRELARELRSFEGVTRKHPVKTVEGLLEPLDVTTFEGEVIADVGEDAAAVKVGDD
ILLIAADGIWGLIDRDPWWAGYCAVLNVNDVLAMGGRPVGVLNVLSTSDVDVCR
EILEGMREGAWKFSTPVLGGHTHPDTPYTAVDAAIVGVTDEEHLVLSSTAEEGDLIV
FVIDLNGRPYPEYPLNWDTTMKDPDYLRRQMEAVVEASKLVKAGKDVSNPGLVG
50 TLAMMLEASGCLGAEVWLD SIPKPEDVDMVTWLKMYPGMGFVYAVDSERDVRAIR
RVLS DARLEVSVIGEVTEGDGWWKVGSEGDESARVDFDFREDRILGVSPR

<SEQ ID No.:0796;PR1;Methanopyrus kandleri>
 LRVYVDGEPVDVPEEATVRDALEAAGVSVPEVDVTIAVFKGEQKVERETDRLRIMLET
 GDEELSLTVAVEDERMSEVCEELPGASVSWTTRDEVGLGPVDVSDLEFHTRRGVE
 VPPYTAILILPTNDPSEAYFLITKRMAVEYICTDIHGRVTAGRELVDLGGGERVTH
 VEPVVERATERVSVRVTLDGDEAGDRIITRVEIELEKNAPVSAEHLNNTLEMEEGRL
 RIKFRDTFTFSIEPRFVLDPEENVDMRERGVTVRNRGVDEGVVYVYRRDRTPVE
 SHNVVGRVRRGMELLDVVAEGDRVLVETDPPRVNFVGLTVDEARELAEEFDVELE
 VNGDGDVVVDQEPRETLNVLKERKVRVEVVPEDEVIEIELYEDDAPRSVEYFRRVT
 KMLDRPVGRLKVHFAYADLGMIVFEGNEKLGKKLPPENNPKDRVEAGVLGVTNQA
 KPHAGLIGVRLEDSEEYGPTGETFEGTNVIGRVVEGLGRLREMDQSDMGRTVYVR
 EVRGER

<SEQ ID No.:0797;PRT;Methanopyrus kandleri>
MKVLVISPEYYTYGAIIVAGVCEEHGHSTILRRSPDPEALKRADVLILSLHTTLHLLE
DILEIARQAHEFGKPVIVGGPVVSQVPELVLERFPNAIVAKGEAETGLPPLLQTLEDEG
DFEDVEGIALLRDGEIVDTGWPPPADLDGPSPLKVPRDLGRQDVRGANVYIETHRG
CPGACTFCQVPEFFGRRVRWKPVEAVLEEVRRELTRGGARRFAISGGTVTTYGDDE
EDFVELLKRLADLLGRENVSAPDVRADLLNERLLEAIRDYTIGWIFLGIESGSDRILRA
MRKGITVDDVCEAVELARTVGVVRVAGSFIVGYPGETEDDLEATEELLTELNLDDVFI
NLAEPIPGTELGRVLTELPEEEIPVLRPGEQLETEAGDRALQLQLTAFTTLSRPVPLT
DDVFHEALHNIREDERKVLRI TRFLRGAQGCTG

<SEQ ID No.:0798;PRI ;Methanopyrus kandleri>
 MRMAILGGTGAMGRLIARELRDDGHEVVITGSNPHTAERVARELDVEAAPTNVDAAK
 DADVVVSVPISVTEDVIREVAPHVPEGSLLTDVTSVKVRPVRAMLEHAPEDVYVLG
 THPLFGPTVPSLRGQTVILTPTERSGPWTRRVRRYLERKGARVVETTPEEHDRTMA
 VVQCLTHAVLLAAGAAIGRFLPSLELDIEEVASPVYRLLMDVVGRIAGQDPRLYAEIQ
 AFNPYGDEAREELLRALRRFHEHAHDHNALTEYIAESRERLGRELDLEACQRRTDK
 LLSYLADELRIHQEGIEAILLDVYTNEALEGEVTGDRDRTIRLDGRELPRDRYKILPRCP
 KELAHDGGEVTVLELRTGADPGDVAAVVDALGRNLRALRAERRGERVRVEVEYTG
 KESLEGLLRKLRALGLEVRVAR

<SEQ ID No.:0799;PRT;Methanopyrus kandleri>
VRSIVTSEHGHHYLT EEF EWKLTEE VVEPGACALCGTCVAICPGGIIELTDEGPRLTE
ECARKGTGNCHTVCPRVDTAA YHLGLRIAGR DY EPLTGGYRRAVGAVAADSDLRE
LGQDGGAVTALARYALEEGLADAVVGVTAGSAWKPCVTVVEDPEKVKDLAGSKYT
RVGLVEALAEAADRGIERVLAIGLPCQVNGLAKIQHFEIVAKGARALRNIDGSPA EKL
PEVVATIGL FCTKNFEYEGLVKLLREKGV DIEDVERFDITSGKLRVEISGGETKEYDV
KEFEEAIP EGCRCINDFTARLADVSVGSGVTPEGVTTLLIRSETGEELVEGAVEAGY
LRLRDVNGSDVRRLAKL KCDWAMKEAKNRLKEGRKVPPFWVGDYGGVITRADG
TFAVRLKVGPGWVD DPDI FRAISGFLEEGYRAKFTDRQQLEIHGIPATEIPEVVERL
RETGLNTGSEGPLVRTIMACPGKDNCSGILNTEELARKLEEELAE EPTPYKF KIALS
GCTNSCVRPQH HDLGFAGAVRPGVDPEKCTGCGQCVDACKVDAIRIITVGGQAAV
ADTDYKRCVYCGKCINVCPEEARYAEKEGIIVWIGGKGGREPVEGARLDVFADPDSI
PTIAHTVIETYRELAE EPQKERLADTIRKHGLRQFTEAIRRVLSQ

<SEQ ID No.:0800;PRI;Methanopyrus kandleri>
MLADVPPFVTVRRNLNVTVRDVLRCVLGLRDVEVDITYFALLERGEATVYDLAEELDRD
RTTVQKALKSLVYAGLVTRRKETRPRGGFVYVYKAVPFEEARKIVLRALDEWYEAV
KDALERADVPRSGPE

<SEQ ID No.:0801;PRI;Methanopyrus kandleri>

VIQSPDGTYYVRLALPPGFVKAEILRTVAELAERYASGEVHITVRQGLEIPEVPPSKL
DILLRKLRELGLEPGSTGPRVRQVTCPPGTRTCANALTDVPPLARKLHEEFLDVWV
PAKVIAVSGCPRGCTRPSENDLGLVAVGGDEWELLVGGYRVARLPEQDVIDAVEL
TLEWYASEAPPGTRLHRFVTDREVSELRDVLERL

5

<SEQ ID No.:0802;PRT;Methanopyrus kandleri>

MLPMLFTLLLAGPSQAAELGPADVPGPGTASNPPALALQSDHALIAWKSPEGLGIA
VAKADGRVLVKTGIRTPVASYPAAAPWRGERDLATFVLTVPMTPEGPRIDVDLVEY
SDNVCAVLWTGLSVRGDAAPVVRVDDSTFALVYRCEGKLRVRVFGNVGWWRWI
10 TDEQQQPVELKLSAPGPVERFSVSVAGRPVTTYLLVAYETPAGTEVVAVNLTDPAH
PTIDGAPIVPGTRPVLLDNVLAAYVGADGVHAALLVKGTAWKIASDVKVADATDVRP
AIVSYGVDRYLIVYGGSELRAAEVRIEGTRLGVVREGTLIKEPGYSPTGIGVVRTTER
SLEVAGVILAFYARDGEPTVHVEYSEGLGELPTQHRRRPWWIVPLLLAASIGAYIGLK
LPVYGQFLWLIISRARREVPKHDP

15

<SEQ ID No.:0803;PRT;Methanopyrus kandleri>

LELEPRTVVLRLGHRREDKRITTHVCLTARAFGAAGVLISGDHDESVIESVEDVVE
RWGGPFTVQWVGNWRRVIKDWKRSGGSVVHLMYGLHIDDVIGELRGENELLVIV
GAGKVPAEVFELSDYNVAIGHQPHSEVAALAVFLDRLYEGKELHREFERARLRVVP
20 SEKGKKVERL

20

<SEQ ID No.:0804;PRT;Methanopyrus kandleri>

MTVEIAVISDVHSNLEALKRVLREVRADMLVCCGDIVGYGPRPVECVDIVREWCD
RCVMGNHDYGVVTGDVAYFNIAARIAVEWTRRQLDEDREFLAKLPKTERFEVEGV
25 SIFLVHGSPRPDIWEYVFPHTPRQLLEKLVKAGTDVLMIGHTHVPMYDEVNGSYVL
NPGSVGQPRDGPRAAFGILEVSNGRIVSWDVHRVAYNVDRRTAREIEERGLPEELG
ARLYRGV

25

<SEQ ID No.:0805;PRT;Methanopyrus kandleri>

LDPHETMRRALREGGVHRVRMSEPGRRLVVDVSGPYLRYPIVTAFAVARRDDGAIVE
30 LVAFRDESVDVIETALAVEHREKGRDILVDANLKPLEDMYGVEADKEEVDVVYAKV
HPELHRLLGSEWLSVRFFGPTVGLGSGDVPTLVTRGLGAHIVSELLGEEPAFIDDGE
KTHRPYQEVPPERVEWVLAELTARGYGVVFTKPAVEVLYTLCREGYASPDREVVV
YRTQRSWCERPESWPRRSIAERNLEALEYGLELLRDV

35

<SEQ ID No.:0806;PRT;Methanopyrus kandleri>

LQRITIVALILSIAAVPGSADLMNPVYLTGTLAHELGHALVEAEYYGGIDEVQLDVFPF
KILFHCRDGGKCIDIAEPPIGFVTRGPYDPGTPEEELRKRHKEAMLLYIEDPARFFDN
VSREDAEVTMAGPVVGALISAALSPLDPQGAFFDSAWDNLLNLMPEIHGALTDGKIA
40 WEALIRGRYPVERYLIELGLVTLVLTAAQCPRYALETIESDFVLTLELAPIALLDDL
SKAVLGNLLGLAVKLREPFFVPGIWWGVNLSLLGPDHRKWLFALLDALGWTLVIPW
LDMPWKLYAILKLIDATADLDPGYPSLGSYLGRKVPFIVFLLVSLLQCHPFLEDSKG
IIIMEGSRLRRNGPA

40

<SEQ ID No.:0807;PRT;Methanopyrus kandleri>

LITLTDFGLGSPYPAQVKAVILRIAAPGVDIVDVTHEVPAQDVVAGSYVMSVACPW
FPPGSHVGVVDPGVTERRAVLLEAERGDFLVGPDNGLLIPLAEELGGIVRAFRIL
EDEVSDWEVSATFHGRDVFAPAAARVASGESPERFCEPLDPEELVEPPIAEPEVDD
GHVRAQVWFVDDFGNIITNVLYDEVDLPETVTIRVSGESFEARHVHTYGEADSGDL
50 VVLRSSSDHLEIAVVEGSAAELLGVSTADRLEILY

50

<SEQ ID No.:0808;PRT;Methanopyrus kandleri>

VFITSKEMRRIELNSRWLGFEEDFMMENAGAGVARVVIGEYSPNDVLVCGTGGN
GGDGFVTARHLDSEGVDVDVLLVGRREAIAKNEAAELNLRRLDRAGIPVQEVDRSED
LESVDFERDVVVDALLGFGIRGRLREPVRSAVLRINEASRAGTRVVSIDIPTGLDPDS
GETPDVAVEADLVVSIHRHKRGVRKLRDVFLLRRVNAGIPEIAERICGPGDLITSDIWR
5 RDPWVSHKGQHGRVLIIGGSRKYVGAPQLAARGALRAGVDLVFLLTVDAVPKNDPN
VIYRAVPAERLEPEHLDEVDLEGVDTVVGPGLGADADSVGILRELAESFDGMIIVD
ADGLRGISGVNVDDRFLVTPHAGEFRREFGEELGRSLEDRSEAVRRVSEELGCTIL
LKGRVDVIGSPDGEIRWNVGTGTPAMTVGGTGDVLAGVVAGVAARCREGFEAACIG
AFVVGSAAGCLAERRLSQGLTAEDVAEYVPKVLNRPWAAEPEAVTEVRRD

10 <SEQ ID No.:0809;PRT;Methanopyrus kandleri>

VEVHELTILGGTDKGRPEPVXELTLERGTIAAVVGLTGSGKSALLRDVEILAQGDTE
TGRRIILLDGEEPSDDLRFDPHEHRLVAHVTTQTMGFLADCTVREFVEIHAESRGVDVD
PEEVVDVANRFTGEPIDPDMKMTLSGGQSRSLMIADVALISDSPVVLIDEIENAGIC
15 KHEALDELTARDKIVLLVTHDPVVALRSDFRIVMRNGAMTEIVETTQREREVAELLER
VDTWLLDLNRNVRRCGERLDDVEPPAGIET

20 <SEQ ID No.:0810;PRT;Methanopyrus kandleri>

VKLIVSGTPGSGKTAVILHALERLLDQYNPAVVKVDCLRTDDHEVYRERLGIPATD
ALAKDMCPDHFAAYNLEHMRWAEHAGADLLVETAGLCCLRCAPYVDACLGVCA
DVTLGPNSPAOKVGPFLQTADVVCVNKGDLVSQAEREVYVRKVAEVPNPCRVIETN
GLTGAGCELLARLIEEEAPELPDTLDEVRLREKAPLAVCTLCVGETRVAERYHRGVL
RRIDGFTEYRGE

25 <SEQ ID No.:0811;PRT;Methanopyrus kandleri>

LTDSTRSTEVSKLVELLPGFHCGACGYDRCDFAEALVRGEAKLDDCPYLQTERFAE
ERRRLEKLLLEEIGEAEGARPSITGVLDGYEADLVLSPLPDEPACREILHPFWSEADIE
EGDVIRYRPWGCPTTHFARVLDAEKGLLTVHIVGPRHRLGETDFEYKDVGLCLVVG
FEGIVSEGRVPNVGETVRFVPEHCHMMQKVHSGVVIEAVGDRLRIECIDLKWWAPPK

30 <SEQ ID No.:0812;PRT;Methanopyrus kandleri>

MRAVPRCVCVLEIAVNTVERAVPEDRQKEAILAATERVSELYRMEPTPQPPRLGT
EAQRTVMKYSEDPDPYREEKRRANERAAAVARELESLENIEDPEELLKRAAAAIV
GNTIDFAVAGHEFDLDELREEISSAEFAVFDLKPEDLRGARVLYLCDNAGEIALDKLLI
35 EVLVEELECDVVAVRGGPIVNDATREDAEQVGITEICDVIDTGAEMLGLLATEVSEE
FAEELSSADVVISKGQGNFESIPPEPFPDVPVYFLLRAKCEPVAEELGVEVGSNVAL
RWEPEDENVRRRWREIVR

40 <SEQ ID No.:0813;PRT;Methanopyrus kandleri>

MRRQLPLEPVAAEKVEEEYELVTLLVCDNCDYFEFKPHDREVYERKKGKCPKCGG
TLLVEGVFRTDADPSMFPSYKDVKSVERALESAGYEVKEFRVREDGSSVVFHYERK
GDAHRLARKLAEMKFTAEPGKAGRLVVQRFEVPEQEPGWLALLGLSVPVFAYLG
GWLAFGSTWAAVEFALAFSAIYFGKEIAKLWVAKVEGLRPRLPFFLAVPPFPFPAFSS
VIRSEVRPMLVESLCRVGVAGLVAGFLLSTAMFLLGSAFDHTPVRMLVWHNPWTLL
45 LSRELGIVANPITLAGWAGLVITWLSALPVYPLEGGYILRYYYDTRTVKWFSVASAFI
QGWLHWYHIAVATVIVLVKITAKLPSDRSFLDDDESKSWLPALLLVALFVLLISPAPF
GLWPLEHSKVPHNLQWLFLR

50 <SEQ ID No.:0814;PRT;Methanopyrus kandleri>

MSPGVRALSVYQAELEKRIKSERRVQVIDVTDQVREKVRRESGVEKGIAHVYSRHTTAA
VVVNEPESGLLRDIVNKLLEELVPQGAGYEHDRIDNNADAHLRALLLGSSVTIPVSDG
DLVLGTWQSVLFLVELDGPRSRRLVTVVGE

<SEQ ID No.:0815;PRT;Methanopyrus kandleri>

VELPSMKLP
SAHVEPLKLATAIVIALLLVKIMGRAARAVRGKLEEDLQDLGWWVEK
TLLYGSYLLAFSIVLES
5 EVGDRIRVGEYSGEVVDLRIRCTVLKSRGRRIVIPNSVLVNETVEKLLDSDECEFEV
VWEGSPGEIGRRLLAALEKELDSLKLKYYEISVERVESGRTLVRVRRTAGKEVDSVHGA
VRRALVKRPGGTDR

<SEQ ID No.:0816;PRT;Methanopyrus kandleri>

10 LVEINGVPVEDTFCEAFKGLYARFIVTAADERPLREAAENVAALPATVFGSESEAGVE
RWLDPEETPDGRPGFVAQMWVEYGDDAVKKLEHELKGRIRQGVLRPTTRVFD
CEDPDGYIDTERPIGRCADGYEYTDVRFDRMVHVPIMMGEFLIERRLG
GLWVLFCEVDAALEAGYRAVEALRDVEGVITPFNVCAAGSKPETIYPDIGPTTNHP
15 YCPTLRDRILDSKVPEGVEAIPDIVINGVSLDVVKRAIGIAIEAATEVDGVVKVSAGNF
GGKLGDIYRIPLRECIRE

<SEQ ID No.:0817;PRT;Methanopyrus kandleri>

20 VLDVVGALNVDELLEYIPRMPPERDDSVVRRVRRGGGSAANTICWLAHLGREV
GFVGKVGSDDAGDLLREFEEYGVDTSRVVRGDGHSHTAFCLVSGDDRRILVDPG
VNDELRPDEVDLDYIRKARVLHTSSFIGLRSETSLKRTMKAVADELMVTFSPAT
MVLRGWSYLEPYFEAADVFLNETEAVHLTGDIETLNRLAELVEVTIVTRGSDPAIV
QEGTEISEVAPEPVPEEDIVDPTGAGDAFAAGFIEGILRGEPADRCCERGHAVAAEC
LRIEGCRPPTTEGRSE

<SEQ ID No.:0818;PRT;Methanopyrus kandleri>

25 MGTGGRGRPTPGLNVYEVLFLSLQGEKGKFGVGEPPQAFVRFSGCNLRCAVCDEPASR
SSRRRALIRRVSGEVELELPVPCGPEDVVEVLVELEDLEDTFGTVSLTGGEPLVQP
WGALKELIERLRERGRFVLLLETNASLPDRAPLIDELADVVSADVKLP
30 DRCLRFLERISAEVYAKVVLVDEECYQHAESALKGLHRLGVEPIYLQPATGSEHDLE
DLWELAGLVNADVRVLPQVHKLVDIFIPR

<SEQ ID No.:0819;PRT;Methanopyrus kandleri>

35 LPRVYLDGRELGLRFSACHVIPGHGKCGRLHGHTYHVSVELLGERTEPHGFVYDFD
ELKSTVRELKPLDHRVLLPTESELFIEESGNEITVRLSDGKRYVFPREDVVLIPTRS
LSAEDLAEYLADLELRRLAGDNLKELRVRVDEGWGQGAEVVRRLD

<SEQ ID No.:0820;PRT;Methanopyrus kandleri>

40 LPVVTIHYDKLVKILGREVSFEELAHNLIPMLGSDVERIDEREMVIETEFFPNRPDLYS
VEGVARALKGFLGIETGIPEYNVRRSDVEARVEESVLDARPCCLAVAVVRGVEFEDE
RDLEHLMFQEHHLHWVIGRDRKKAAGIHDFAVEPPLRYFLADPNDRSWAFEPLD
HPGEEMTPAEVLRREHEKGRQYAHVSDGAPILADEEGVISFPPVINSETRVTQDTT
DLLIDVTGTDWRSVLDALHVIVCNLAERGAEILTVEILGAYERTTPTMELDWWDVPVS
EARKLLGIDLSGEQLEELLERARHGAFVPEGERELREYPLPDVYHIEADWREIPPIL
45 YEEDVVRVVFVGPRTNHLHEWDLIEDAGIMYNYDRFEPTVPDFYTPSRADREREFIN
VVRDTLARMKMFVEVNSLTLSPEENYRKMRLEPDGRAVKLANPIQKEYTIVRTWILPS
LMRFLADNKHRYPPQRFELGEVIERDEDAETGAKDRWKLALAIAGPGVGFSEIKS
VVEALLRELDVTGWTEITERKHRSFINGRCAAVLADGRELGFFGEIHPEVLTEFDLEV
PVVGGEFDVAALRTAAGW

<SEQ ID No.:0821;PRT;Methanopyrus kandleri>

50 LEQIVKNALERVEREQGGDDPPSSRGTDQELMEVLERARARILVVGVGAGGANN
TATRLKEEGIGGAEVIAINTDAQDLVSCKADRKVLIGYELTRGLGAGGDPRVGEEAA

5 KEDMEKIKEVVEGADMVFTVCGLGGGTGTGAAPIIAEVARKEGALTIGVVTLPFSVE
GRRRIENALEGLERLRQVADTCIVIPNDRLLIIVPDLPIAAAFKVADEVLINAVKGITEM
ITQPGLMNLDFADVRAVMENGGFALIGIGEAEENDSESGSRAVQAVENALNNPLVDV
EVSGATGALVNIVGGKDLTLKEAAEEVELVASELSEDATVIWGAQIDEDLNDVLRVT
VIVTGIEDADLEAMFTGPRQPKRTEVKEVAAESSRPEKVPEVSKGGAESSEDERPS
SLEDLEKIL

<SEQ ID No.:0822;PRT;Methanopyrus kandleri>
VSTYEELISLLRDCKRVLRAARKPTWDEYIESAKIAGLGILIVGGVGFLIRVIVQLIELYT

10 <SEQ ID No.:0823;PRT;Methanopyrus kandleri>
LAETDSTKLYAVRVQAGREEATADMLVMRARRKVKEEGIETGLKAVIAPEELRGYVII
EVEELTDELRLDIHDLPTRGIVEKPMDFEEIEHYFAPKPEAVEISEGDVVEILSGPFFK
GEKARVVSVDSESRREITVELLEAPVPIPTVKMDALRLLREEEYEG

15 <SEQ ID No.:0824;PRT;Methanopyrus kandleri>
MPKEEVEVLIEGGKADPGPPLGPALGPLGVNIQEVVEEINRKTDFKGMIEVPVKIIVD
TETREFEVKVGSPPTSIIKSELGIDKGAHEPRHETVGDLSMEQVIKIAKMKFDDLSS
YDLKTAAKEILGTCGSMGVTVEGKDPKEVQKEIDEGKWDDLFEKYEEEEEE

20 <SEQ ID No.:0825;PRT;Methanopyrus kandleri>
VTITEEDLIEPLRKVVEYSPRRFLETVDMIVNVKGVLDSDPSQRIDKEVVLPHGRGK
PVNVCVIAEGEMAREAEAGATVINREKLEELAENVREAKKIARRHEFFYAQVDLMP
DVGRVLGPVLGPRGKMAKPVPPNADIRALIERAHRARVRMRDQPVHTVIGARNM
25 EPEQLAENAMAVLREITSELEKSWAQIDSVYVKTMMGPAERVY

<SEQ ID No.:0826;PRT;Methanopyrus kandleri>
MGDCAMAVKAKGQPPSGYEPKVAEWKRREVKELKELMDEYENVGLVDLEGIPAP
QLQEIRAKLRERDTIIRMSRNTLMRIALEEKLEDERPELEPLLDYIEGPVAFIFTNLDPPFK
30 LYKLLLEESKASAPAKPGDIAPEDIVVEGPTPFEPGPVSELQQAGLPAQIQDGKVVII
TKDITVLVKEGEEIDEKTAELKKLEIEPMEVGVDIVAIVAEGTLFERDDLAI DFDEYED
MAKEAAQHAFNLSINAAIPTAETADVIVAKAHTALNLAVNAGVPVPDETVMGCILAK
AHGEMLALAGAIAEVDEEALDEELLEMVSRSAEAAERKEKEEEEEEEEEEEEEEEEE
EEEEEEEEAAAGLGALFG

35 <SEQ ID No.:0827;PRT;Methanopyrus kandleri>
LPHNVVLTGRPGIGKTTVCLKVRNVLEEEGYTVGGIYCPEIREGGRRIGFEIVDLTEG
DRYLLAREGASGPRVGRYGVFVDNLERAESIERAVKRTDVVIVDEVGPMELKSNA
FVDAVRRADAHTPAIFVVHERSRHPVVVDLREERPDVVRFRVTLNDRDELSDRILE
40 HVLEWLEER

<SEQ ID No.:0828;PRT;Methanopyrus kandleri>
LEHLECDVLVIGGGGAAARAAIEAARRNLNVVIVSKGAVGRSGCTVMAEGGYNAVL
RTADPDDSFDAHFRDTEGGAYLNDQDMVEILVREAPKRLLDLENFGAVFDRNED
45 GTLAQRPFQGGQSKPRTCYAGDRTGHEIMMALLDEVRRLDGITVLERMTMGYGLVRD
HDGRVVGAVCVDLQTEDTIVITAYATVLTGAGQQLYPVTTNPVHKTGDGYAMALR
VGCPLIDMEMVQFHPTGMVYPESVRGVLVTEAVRGEGRRLYNARGERFMKRYDP
ERMELATRDVVARAIYREIKEGRGTEHGGVYLDVTHLPDEVIEEKLETTLKQFLRVG
VDIRNEPMEVAPTAAHFMGGVPIDADGKTPIPGLFACGEVTGGIHGANRLGGNALA
50 DTQVFGYRAGRAAAELALKLRRRGRRIQVRKTDAPTVESEIWSTVGQEDPIRVREK
LRETMWEYVGLERSEKGLKTAIKTLNELKETVESGLDDEYGLRPVLEVRNMVEVAIA
VARSALYRTESRGAHYRSDYPERDDKRWL RHTVYRPNGLATRPAKITRLDPRQ

<SEQ ID No.:0829;PRT;Methanopyrus kandleri>

MARSNRRGGRGDPEDDPAWAPPGHRCAGERAVGGPTVIPRAYLPAVPAGGNESR
AFQGRFVDPWFSGIRTGYVIWDGGRLLGVTRNEPEHADVIDVDGIICPGFVDAHVH
5 VESSGLRPARYAEIVVREGTTAVVWDPHEVVNVSGELGLEWAVKTAEEALPFKFYI
ALPSCVPALGPPYETVEGEITVDVARKFASHPMVSVSGELMDVAGVMEGEKDEFIE
LKSLYGLTVDGHAPGLTGFEAMRYFAAGPETDHECSTAEFTSRRELGVWTFVRQ
GSSSKDMEVALETLEDLRGVCFVTDDLHVKMDDEISLRKIVGRAIEAGFDPLESLSA
VTLNPSLCYGLQSGRLVPGFHADIVVEDLDENMELTDVWIGGKRSEVRFRDAEA
10 ELPDVELSVDPREVSFQDGKYEVRVGLVRGSIREEIVREITVKDGAVKDDDDVAF
VVTDRYGQGSWSIGFVEGFEELDCAVVSTVAHDSHNVVAGRRLLDDVRRALQLVS
EVGGCVGAVAGDRAEFVRLDVAGLMSSSDPEEVKKSIEDVLELIRSSSGVDWDPF
QALSFTLPVPELRLTDRGLVKVEPDEIRFVDIITDGDPE

<SEQ ID No.:0830;PRT;Methanopyrus kandleri>

MKDLLWWLLTVVYAPDFEKWMRWCPVCSRPLSYYSATDVHYPPLGSLLPALWW
YIGTHTLGLSPHTWEFRVLWKVPAWLGAIMCIYLIRAGVGNVGTLVVAASMAYPC
VFWQLDTISMVPALATAVCEGKLAGLCAATALWMKPTAGIVALPFLRRQSIPTFLA
SVLICGPYLIANGWDFVHDVHIFQVNRSPQNCISWTLLPGCPGIEAAVGTLSVVVPLA
20 MRGNPELAAGCIGLALLAFSKVNNPNYWAVGCPMVCLISWKQGAMVLSTAACFLTA
SAVSIVTTKEYNAEDGRRYSIRELFIPPPPTDLPVGNAAARYLLGTSILYHFLVTSC
LYIRNLRKLAVSS

<SEQ ID No.:0831;PRT;Methanopyrus kandleri>

VKRVLLALAVALAVALVGGAELAKVYSGKYTIKPIQSVSEAPSEVQLEKGQTTADVTV
TATITWTGNYPYTIKRTPTTVFAVDGQTVDTKTINPPYKLGDRTRTVSTTLKLTGK
TITVTAKFPDLPQYGITGGTATQSVEVTVVAPKPAIPHTLAGAVVKDLLAVPALMLL
DPFMGYPLSDMLGYKTDLQNFDDGLREFAENDVGAVLPAMVLATDLLAGWGLD
HNVMPTLSMLDVGTMAVAVAPLLYALGVGDVENPLVDLAQELGLEGSVITEAS
30 AVGLALPTVSTVLGYLADKGVATAAQIVAPVVKALDQLLTMLASPIAGYLA

<SEQ ID No.:0832;PRT;Methanopyrus kandleri>

VAKIYGDEDASLEPLEDKTVAVIGYGSQGEAQAKNLRDSGIDVIIGVREGGPSWERA
KKDGFVLPPIPEAAEAGDVVHILIPDEVQPQVYREHHDNLEKGNALGFSHAYNIHYG
35 LIEPPEYVDVLVAPKGPVGHMVRKLYTEGFGTPALVAVHQDYTGAMDLALAMAKA
MGFTRAGVIKTTFREEVETDLFGEQVDLVGGVLYMILYAFETLVEAGYQPEVAYFET
LHELKLVLDLIEKGLSGMLDNVSNTAEYGGLTRGKRIINKEEMRKVLEEIRSGEFAR
EWTLENESGRIVMKRLREEIENHEIEKVGERLRKMMGFED

<SEQ ID No.:0833;PRT;Methanopyrus kandleri>

MPAPIEVGRICVKTAGREAGKYCVVVDIVDENFVIITGPKDVTGVKRRRCNIKHLEPT
PEKVDIDRGASDEEVKEALEEAGLLDLMKEGIVSGS

<SEQ ID No.:0834;PRT;Methanopyrus kandleri>

LATVVMKRLIAVTLVAGLTILSFCGYESVAKAPTWKDAERALYHYGLCLVLSACSIRR
VPGYSSVNILLHGYSGTSPSPVPLRWLAWQTAKVIGLSILLSGFPALVVKWILSG
DPSRWVLAFAVLFGVLVFKVRAFMSVLSQLAVTILDISEYRADKRLQLSALVSHGLRTI
SLLLVLAVVLITYPVISLCLLPMTITLGWIAWYLVHMSRLPWKDHQVCRVLKNRLRP
VLVSSLLLCVTFTLGLTTDYFTNVSVRIWEYVSGEHVRTVHTLVPAVLDDQTSRLRI
50 AETHRADMSFLTLDVLRDRVVVLIGGESGQATAIDPRTGRSLGSQKLPPPELRESSVE
ALTEDLEYAYPYLRAGLPVLYSGKLTVSGWVADVWIPFAGYTLMIPEITLEVGRG

FKPTEAPAFPGVDWGITWYPARLDGRIVPVVIPSTVCFTSSIRVPGSLVIPLYGPTAV
RVWLHQPCFIEIERDRVYVLKPEYYPDGILMKVEKIRV

<SEQ ID No.:0835;PRT;Methanopyrus kandleri>

5 VITVVFTGYKGGKLRFLVLAEGDPEDGAEISIEGHLELSGGGEPVRGVLGGEPTPPDR
VLSELQKADRKIALPDVAEVVDRVLGEKIEVKELCRRCLASDRVTVLKHGYRFGEVE
VCGRCAREILEEELRFRVPGFSQTLLEKLERLLHELRLDIDRVVEMVDPAFDPAEEEE
KTRWEIVEAEDEEEHRLPLTELDIPEELRRVLERMGYQELTPVQTKCVERGLLEGR
10 GIGVRLQVGAARLKEFSGPERGSPRDADIIVGTYEGFDLLLRTGAVDPDDIGVVVID
EVHTLADERGPRLDGLVCRLKTLTGAQLLGLSATVGNPEELAEYLDAEPIVHNRRPV
PLEYHLVINQDRRQKWDRIARLVESEWETEYSTGYRGQTIVFTYSRRNTHRLADLL
NERTGLDVAPYHAGLPYDRRRSIERAFERGELAAVTTAALGAGVDFPASQVIFESL
AMGIEWLTPREFQQMAGRAGRPGYHDRGKVVLMVEPGRRYHRSQSETEDKVAFT
15 LLESEPEPVEVEYDDEDEREQVLAHLVSGAAKSPGELERVCDSESLGFAGDPMRRV
KELREMGFVKGLEPTEKGRVAARYFTGPRTVHEL SARAGSDPLRAVASVRPFERF
QLSPSIKRAVERVTRMSVPSRLDDALSVIHSEKVEIERLPPKEKQKLVSMLMKELDC
GCDAFPHCEHVSQRASELALKVRLEGKSVYAIPRILEGRYGITAYPIDIANWLEEVVR
LLECAGEIAEEPMAAAAALADPWSER

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<SEQ ID No.:0836;PRT;Methanopyrus kandleri>

VRRLVLP TLLTMVFLAVPATADTTATTPTAEVSTSTQGTLLQQVTQQTTQQEQTPGA
SGELLQPQVAPKALGYIAVGAILCAIPNRGTQELGADLTQLGAEALTAAAVDHGLPLK
YPVAYQFNRTYEKLSSPMYWGVEVGFNIVAPMLVNSMLYSMLQPLSEQLEVPPDVIK
25 NYIVQTCKLMAKLQDRPVSPEDVIPVIDSAIQIINQSSNQSSQSKLTEDTKYEVAKTIA
NFLNGIRGSSGVLIASNVCKFALRYINVEPSNGIKLWIGSVLSPVVPDVSGTISDVRNI
TRDINNAMIGVRIATNPVETIRQITEDTGNIIETFRITIVKNADKLGISEETANEILDDLK
SMISDLTSTITDEIVRPYEPIVRCLGIALAINSLMDAYNSFNRLTQRLSKLALIARGLG
QVPTLTNPEGELKRALGVLQQGRVGPPLPF

30

<SEQ ID No.:0837;PRT;Methanopyrus kandleri>

LIDRLAKKYLTPEKVAELGFQITEELALRALNLIRNL RTEAKLEGDSYSFRVWDEKDR
YEISASGEFRGSGFTLEFEKRVLDTRVRGHIEVEGEQVTELMRRLLLEILKEGKES

35

<SEQ ID No.:0838;PRT;Methanopyrus kandleri>

MSGTQYRLIPVKSRYWKVGSGAVENALEALRGIELKDGDVLLLSEKAVAVAEGELID
ERGYEPGVLARLLVILWMRVVWGRILGPLMDPPMRRETENLRNYPLKDGSR
HKQMILEEFGLLHALEPVSEAGCDVGNVPGYAAAPVPESADRVARELREELRRRR
GVDVSVIVGDTDKTYEILGILFTTVARAHPDIVTGTGVIGFLVGRLLAKTVGPTPIAAG
40 DVSVREAIKLLDMAEDVRTKGAGRTVYDALEEVGDPESLDEEFLNGFEHVPIVIARP
VTP

<SEQ ID No.:0839;PRT;Methanopyrus kandleri>

45 VEIQNIVASVDLKGEVNLDECSVILQGEYEPEQFPGLVYRLEDIGTVVLIFRSGKMVC
TGAKNREQIYKSVREVRDLEKKCGVKFHGEPEVEIQNIVASIDFHVPLDLDTIAEVL
VGDEDVEGIEYEPEQFPGLVLRRLREP KVMALLFYSGKAVCTGAKTEEEPEKAVKKIA
EKIEKYGLKLTG

<SEQ ID No.:0840;PRT;Methanopyrus kandleri>

50 VPVLGLGHNPVPPVSGFTAGARVLLNRHRETVGGSTLTRVLGIQLGNTGTDYCVMN
EDGDWEIVAREEGVFGKISCVFTLEESRRALREEIAPRVIERVRRVNPDLAVVGTV
ELGLILGPMIHEKTGVPTLAVYGDPWGPAGDGA VGPYCVAAEYPNCVHVDVGAM

AVVTPIRDGRPDFGDAVSVSGTFPLDLAARELLGKEYDEGGKKAEEGEVDENFRRE
LRSVDVDGKPVFGRVRGSLAPVPPEQERVLRDHIRDAGAPAEDVLRRTLVELVAETIV
INAAQYDMDLLVLSGGGVKNELLKRRVSELWEGDVSIFAGEELEARGLCLLGLRYLE
GEPVPALPCEGGTGRGGKT

5

<SEQ ID No.:0841;PRT;Methanopyrus kandleri>
MPKTKHWHYSIPPEELDDERTAKAFIRELRISPKHAREICRAIRGMPLDRAKEFLRRV
IRKEEAVPFRKHKKKVPHRRQIRPGWDAGRFPKEKAAREILRVLEHAEANA EYKGLD
TDRLYIKHIAAHKGRVIRGWIPRAFGRATPFNTPTTHIEVILEER

10

<SEQ ID No.:0842;PRT;Methanopyrus kandleri>
MVMYGENVPVHKKFVQYGMLKTELDEYLEELGRAGYGGMRLQRPVNATKIIAYV
ERPAIAIGRRGRNIRRV EEEVQERFLLGRVSIIEVKELPSPELNPRVVARRLASALER
GIHFRR AAYGALRRIMNAGAKGAMIILSGKLIGARARTEKFMEGAVKYCGEPGDEY
MIEGYVQAVTKPGAIGVTVRIMPPDVELPDELEIRPPEEVEDELKELIGKSEDEAEGA

15

<SEQ ID No.:0843;PRT;Methanopyrus kandleri>
LGKFKLRPDEIREMTPEERREKLKELKAELLREMTSKSISGVDPNPGRVKEIKKNIAR
ILTTEREEELRKIRETEKG

20

<SEQ ID No.:0844;PRT;Methanopyrus kandleri>
MQEDDICPVCGLPKELCVCEEVSKETVEKIKIYTEQVRPGKVVTIIEGLDDAGIDLQE
LASKLKRECACGGTAKEGKIILQGDHRNKVREFLIKKEGFSEDAIEVT

25

<SEQ ID No.:0845;PRT;Methanopyrus kandleri>
LELRYRTPSGMSCLYLPRCAFPRSGRDAWRKKKQVETILTLLCSRLKPGDTVVD CG
CGRGTLTTALAVSSPSCDVLGFDIKEFETWTELER YVESVGLDNLEFEVNDLHETAK
YGLPDDPDVIVGLHLCGTLTDRLLKLAVNSDAH FVLVVPCCYGRASPRVIVEELGVD
EGIERVREVLKRAESSVEYQLEVC RMRGKFLEE HGYQVHVGVAFPEEISGRRVFLM
GIT

30

<SEQ ID No.:0846;PRT;Methanopyrus kandleri>
MRPDRTSEHTSVNTDSSYRRGFDTLTPSPLPPPDPEELVGKKFRVVRANSRTYL
GISGRVVGFTKNCLVYDDGGGDQKILPLRHIVMEVEGLRVDGRTLRLRLQEL

35

<SEQ ID No.:0847;PRT;Methanopyrus kandleri>
LIIPLVGGVLALLVLAASVRIVNQYERGVLLRLGRYIGTREPGLNFI VPFIDKMIKVDL
RVVTQNIPAEVITKDNVPIKVD AVIYYRVVDPVSAVLNVEDYEEAVFNLAQTTLRSV
LGEVDLDDILAKREELSERIREIIDEKTEGWGIHVTGVEIRDVILPEEMRRAIARQAEA
ERDRRARVIAEAEKQAAQDLRKASEVLGVNPGLLRTLQTLSEVSAEENV TIVIPVPI
ELLKLLKEPE

40

<SEQ ID No.:0848;PRT;Methanopyrus kandleri>
VDTLSQELCLLLAGVGLIVLDCVLNTGIVAMIGVVCAWVGAYLMGTYLIATLPPGAF
VLLMQVA AVLRRTEESSDVLLKSVGELKGE GIVIREDP LLVKVRGEPWRAVSKTRL
RRGERVVVLDVKGNKLVVKRRKTGERR

45

<SEQ ID No.:0849;PRT;Methanopyrus kandleri>
VDVVIGAGPAGRTYAMILAEAGHEVLLDRNGKEGTGGKCLNEACVVLGALIEAARL
VWAKLGIPGV ELVDVG DINFRLTRSVRKVVETIRQRLIKETERAGVEILRAEAVKVD
ESLN VYTKDGDVLEADRVLIATGSRPAIPEVEGVDS DAVFTFREILEMEVPSEL CVV
GGGPTALES AFAFAALGSEVV LAYRSRILPNAPEEVRREILKDLELVGVNAVRAGEL

50

RAIRETSSGVECRFERGATVADAVLLATGLEPNSDIAANSGLPLRKDGSVVDDGM
RTPRDGVYAAGDVTGPPYLTPVARYEGTVAALNALGKNVRRGNPPAPRVIRLFRDF
GRLELRGIDWEGSLPTPVGGPAFWMLHHGIKGMVCRKRGVTTEAFIVAPRIAPML
PYPRCVEPDWRLIEVHPTDPVIGLLKQLGLRRTLGE

5

<SEQ ID No.:0850;PRT;Methanopyrus kandleri>

LGKVLVTTALAYTNGPLHIGHVRSTYLPADVYTRFLKMRGIDAIHIGGTDNHGVPIAL
QAELEGKDPEEIVEKYHEMIKEDLERLNIHFDEFSCCTREFNPDHVDMTQWFFKRL
YEAGYIEEREVEQLYCPECERPLPDYVEGVCPYCGAEGARGDHCEACGRYLEPV
10 QLEEPRCVICGSKPEVVRTMHLFFKLSEFEEDLKKWLESNDNLPKNVRNYAIQWVR
EGLKDWDIVRDLWDGVPVPLEGYEDKVIFYWVFDAPIGYVTFKQYCDRVGQDWK
DYWFSEDTKIVHFIGKDIIHHALFWPAMLMGVGATLPYTIVAGEYLTLEGEKMSTSR
GWVWWVKDFTKLFADLLRYYLIVVSPLTRDADFSWGDFRDRVNNELVANLGNFVY
RTLSFIYRFLDGNVPEAETDQEIVDKIKETHQVRTEHLEKFRFREALTEVLRLSKFGN
15 EYFQEHEPWKLKDEDPERCAEVLRGCARIVKALAVMLAPFLPDSAEEKWQSLGYED
SVHDVDWEEALEDVETKEIPEPEPIFPKVTEEDLEKAKALLPEESGESEGGDDEYVS
LEEFNRLDLRVGKIKEAERVEGSDRLIKLRIDIGDRTVTAVAGLYPTYEPEELVGRKV
VVLANIQPKEMFGVRSEAMILAVGDEPALLTIDESKREVEPGERIR

20

<SEQ ID No.:0851;PRT;Methanopyrus kandleri>

VCFTLAAVVLISDSEIKWRIHDALYPMILGSTAEKDVMLLLHLGLLFLVLPYRSRIPLPK
IDTWVTYALMAAILAVPPALQLLMIYEAGFNPGLTGTCIVTLTERPETSSFYHCHAVKA
CLGALISAIFGEPKIEFHCGVPLSFVLPWPVPLVALLAIAYVWLAWIVPLRADRTEK
AIVLSIAGSLLCLGCLDGGPLANPSVVGSLILLASRIRTVAPPIASLGVLGGLDAFRQV
25 LFYLPAYHTLTYLWTAFLSSLLPSTVDRIARRSTLAVSLCLLGMVPHLPVAEPLRST
LGLASEHDYYRVDVSNNGDPAEVRAELSRIPGVEAVSIRVTDGRVTACVKTKRGVKL
QVPKARVRKIRGYILELRVLYGSPRDLTEALKSTDGVVGVLGVKKMGSVYRVELGA
EVDREVNVLVPSMVKQLRRHGVVVSIRVTFDVARCIWG

30

<SEQ ID No.:0852;PRT;Methanopyrus kandleri>

LRTKIVAVLLISAIFIGALMGVITYQWSISSKGARVGCYHVAITNVKGSVEPGDVKRAL
LKCPYVIRVGGIRTAPSSCDAYIIVKAPTPVSKYDIAQELSQUALRKAGLGKAPAVFLN
SVNAYVVEVAVEDPKIPASVAARKVASAPTILAIFKVERRGSVYVFEVASLEEEYPVA
YSVTGALKLAGLKPVGVANVTPVKWGYVL

35

<SEQ ID No.:0853;PRT;Methanopyrus kandleri>

LILCLALLILTSPYLAQMILQYNTPYGLKAGTLVVVSGGSSVGETSSLTHTHSLKACV
GKVMNYVIGIPTKYHYGSVLSKFMPPTWAAVIFTAAVIAASYVILAILSPLAVFHERGSA
AESLLLWAGFLVVLGAVDGGFMCKPMVIGLGMVWALGPLPVRRYVIIAVLIGLTP
40 MLLQATIRVWYLTSLAPNSVWVAVALLMTAARGQGW

<SEQ ID No.:0854;PRT;Methanopyrus kandleri>

MKAFSLVEPSPAKNLLPVWERLLEEGWEVTYVYGHGRGVEILKWEGIETKQLGKPRR
RQGLLGYYVGFSDLIRTVRALASERASVVLSSGNTGDARKSLIASRMLGIPSVHLEM
45 DVYNPVEAVRWATRVLVPFSEKWAEVLRKRRVGVETKVVSGAPLAQYLADRHLSGR
IPGPVPEEYEGRVLVCLGGDITEEGARRLLSDLEDHDPVVVPFRVSPPEGFECVRE
FVDLPGVMMMLADTVVFAGGFGVTIEACVAVKAVKVSEVHPKHLSHWIAEESGPVP
MYLSESSGAEDAVQMARKPRGEWLIRGRSAVAEIVEEILEVG

50

<SEQ ID No.:0855;PRT;Methanopyrus kandleri>

VNSVRTADVKTTRTKETEVEVSVNLDGSGRAKVDGLPFFDHLLHQFAFHGRIDVEIK
ARGDLEVDDHHTVEDVGICLGKALNEALGDREGIRRIAWALVPMDEALVECAVDISG

RPYFVLKGYRPRNRIGSPPLSTENVSHFWKSFCDHAGVTMHVVVRWWDNDHHAI
EAMFKA VGRALGAAKEIVGDGVPSTKGTLRRG

5 <SEQ ID No.:0856;PRT;Methanopyrus kandleri>
MERTVSIVCIVLGAALLWMSSGASHQVVGARELQSTDDGTLVRVKGEVLQVNVVSD
GAEVVLDAGDGT VTVFLSREAASTLAPTGESLEVVG RVEEYRGRKEVRVDSPV
RAR

10 <SEQ ID No.:0857;PRT;Methanopyrus kandleri>
VWIRRYVPAKALIVVIITTLTVPYFVFGKPRGPGYPTELYGYRIVLEDPALAVVDVEP
RRTLLFRHTLT VSDGWSVHPVFDIPPLIFVRAERMDTLETVKRNLWAVVLQEGAG
RVFMPDEFVEGGV PGLITGIAGQAWAWKHLKWAREFGVIHGLRRYAKEVGPERIST
AILEEYRRAPWRAILDFCDMMKNSDVGRFLRSRGLSFRDFTSKDPKLVAEVLVLD
LGR LDERV VDERIRYVLDARAYPIPESEEKIVDKAARELLRHG

15 <SEQ ID No.:0858;PRT;Methanopyrus kandleri>
MAASERNTGKFTEEC PACGSAEIVFDEERGEYVCANCGLVTEDPVIDPGPEWRHF
NPDQRQRRSRTGEPVKLR LRPDKGISTIIDREL RDSGGKKNPRMRRIRTDARIKVS
GSRERNFFQAFLELENLASKLQLPESVRELAASIYRKAYKEGIVRGRGIESVLGA AVF
20 AACKEARVPRTAREIAEALGVSDENEILRAYRVLQRRNLKQKPTPSDHLPRFASK
LGVSENVQAKAQEIIEKAKEKGITVGKGPAGVAAAALYASILEGERRTQKEIAEVAR
VTEVTIRNRYKEICEALGIELHP

25 <SEQ ID No.:0859;PRT;Methanopyrus kandleri>
MRRLGRALHVT PRGNLIARADHVPPLGAPVVTRRRRERVGVIVDVFGPADKPYVAIR
DKSRHHLERFVGKELFIPPRRRRRRPPRRRRRGRPRRRR

30 <SEQ ID No.:0860;PRT;Methanopyrus kandleri>
LPCRTHALKLRPTCHPPHRTLRSRRRHLEPVRPTILPGGASVQVVRRIEIDRTRC
EGASCALCVEVCERGVLKIKGEEVVIADLEACDACDECVRVCPNDAIDLRYRERQ
FLSAMVRAMHGDGDGLEVARRVMMRGRDVF GDTWFYLRRELERTCRIKREAELE
GKRAKLYECTCKVCGKKFKSNKKLDVCSECANR

35 <SEQ ID No.:0861;PRT;Methanopyrus kandleri>
LNRQDPIEKTKELFIKVSRLGEEQPEISVRREEDPSGHILNPWVANSEGADDVWPL
VFEVRSKDG VAREFTLLVPVRLERRRLREILLKVFRS

40 <SEQ ID No.:0862;PRT;Methanopyrus kandleri>
LYPRGREATLA AVLHTILRDRPSTQKEIAEKVGVSRRYVTELLRPLIEEGAVRRTYTV
DMSKLRRHFPELFEELGNFLYEDVEMHLEGVRPYFKRMTDLTLEQIETALIAVEENP
EQAPKVIEMDEEVNRLDEEIRLYVRTLPVLHPCEEAGKVATLLLEISHCIERIGDYAC
NIAEVAETLGTLS DLQCWREVREAAL EARS MVKTAYSIFLGRVKEEDLRHEAEKVYC
AEDRVHKNIRACEKAVEETKEFPEKADRLFGLSRITKDIERIADKAVDVVDFTRELVE
GRPRDLTPEQEMRSTLPADGTH

45 <SEQ ID No.:0863;PRT;Methanopyrus kandleri>
LYYIGLGGFGCRFSTHASNAGLEVILCAGSRGDLLRVSEGEKIEVASGIGFSRDWRK
ASEELQEQAETIRETLERVGAE EPTVLAFLG GAVGYALAQQILKEPPVPFVILTTP
GESEDPQVRRNAAEQVKS VLGVS IKLPVLWVDNALGGYERNRVLERTLLDLRDFL
50 GVPVEELPNLAGNYALSPSISGEKVTGDVVKTSAD EVRKLVKSREPEEHVRRERR
GDPDES LRELF

<SEQ ID No.:0864;PRT;Methanopyrus kandleri>

MARKARVTLTLEDALARVLATKDALEGDSISATVGKLVKFGFAYLREKFPPELFEGIN
LEEYREKARERWFDGSSRS

5 <SEQ ID No.:0865;PRT;Methanopyrus kandleri>

LRAPEGFLLGGIKREGIGVGLIFSERRCAVAGTFTENTLRAAPVEHSEEVCDRGVAR
GVIVNSGHANAMTGEEGYQDVLRTAEIAELMGAPPEDEIVVCSTGVIGERPPVVKIV
RYAREVWEDIGPTERHVREFSRAIMTTDTEEKIALYEGDGWSLLGIAKGAGMIHPN
MSTMLAFLLDVGAKEPKELQMWLRDVNDTFNMITVDGDESTNDSVLLANGSSNL
10 KVGSDVTITEFQRALEEVCTELAEKIVRDGEGATKLMIVCVHGASNEVEARRAARAI
ASSNLVKAALFGENPNWGRIGAAVGAARVDVDPDELRIAFRSSEGEIVTYEGGPVD
FDEEKAKRVLASASEVEIVVDLGVGDASARAWGCDLTYEYVRINAEYRT

<SEQ ID No.:0866;PRT;Methanopyrus kandleri>

15 LTDREEVVELRGHIIDSLIFSRVLDTIMEMGGDFEILEFKVGKRKTDPSFAKILVKGKD
PEHLREIVSELRKYGAVPVHTQEVRLPAPADGVCPRGFYTTTNHRTFVLFEDGEWI
EVEDIEMDCAIVVYPEERRAVAKPIREVREGELVVVGDRGVRVKPPERPRGRTGIF
GFMESEVSPEKPTPTLIRRIAELEWHRKNGKIVVVVGPVIAHAGARDDLAWMIREG
YVDVLFAGNAVATHDVEASLFGTSLGVDLETGEPVKGGHSHHLYAINEIRRVGGLR
20 EAVEKGILKDGIMYECIVNDVPYVLGSIIRDDGPIPDVITDVMEQAEMRRHLKGATL
VLMMATMLHSIATGNLLPSWKTICVDINPAVVTKLMDRGTAAQALGIVSDVGVFLPE
LVKELKRVRDDEA

<SEQ ID No.:0867;PRT;Methanopyrus kandleri>

25 VSERDTKKYDMIIPLGVPADVIAEVERRCDDVKVVQREIERGGTKTTVLAFRGTKDAL
EEAKKVMEEIERRVEEWTKPRRRGPS

<SEQ ID No.:0868;PRT;Methanopyrus kandleri>

30 LSEKSSRKERDEKTEKETARQKGHRIRVKSRYHEMPFSRGVLARSLTAIGVEPHK
AYEIALKIKEELQDEGIEEISTDELADIIRTKLEEIDETLAERYELWRRIKKREEPIIVLIG
GASGVGTSTIASSEVGHRLGITNVIGTDAIREVMRRVLAEELYPTLYESSYTAWKRLR
YEPADPVITGFLDHSEPVVVGIEGVNRSINEGIHVIVEGVHIVPRLIKKEILNYPNVF
VFMLAVEDEEAHKWRFYARSRDTKLSRPAERYLKYFEEIRRIHDFLVEDAEEHDPVI
NNEHIDETVDQIVSYISSKLLKGERELSKSVSWW

<SEQ ID No.:0869;PRT;Methanopyrus kandleri>

35 LTFREKLRGCKVEELMTKDPITASPVGVIEAFEIMLKHDVGALPVVDDEGRIGLGLVT
RTDLGRALLEDEYEPGTTVEEVMERDVVVHPDDTLLEALKRMTSAPEGIYNQLPV
VDDEEKLVGILTDGDILRWIAKKL

<SEQ ID No.:0870;PRT;Methanopyrus kandleri>

40 LFGWIRRHRSIVTAGIIFLAAMMVLSAIPSFMMGGQSAVAAAEGTVDASIVKDYQV
SVVRYLAVPKPGVKTSVKSASVSSAGGVENVVDVRKVVIKGYTVFVVDALVPLTADP
EDVKKRIEERLKDQVLDARGTVIKGSKFVFQASYDGKPDVNAIKRAIRRELGNRLMD
45 GPKLKVRYNAVVEVLCNVSDGKHTLIEERIERALHSTGARGCLVIEQLIARLGAKL
TLLGPGKEKVGDRTVNFGDRMAMVLVLEHAHAKSKHLTLALWISNSGGKQRIYVDR
DILRGKYIVF

<SEQ ID No.:0871;PRT;Methanopyrus kandleri>

50 VYEVEVKVKLKNPEDVRKRLEELGEKVRTVRQRDLYYQHPCRDFEAETDEALRLRCS
DDKVALTYKGPKVGREKSRVELEVVDDEFETTDAILRHLGFEPLEHAEVKKLRTVYT

LEVNGEKVVAALDEVEGLGTFLELECKADDESEVDEKEKLLVSILEELRVEGKRVRH
SYLEMILLDQGE

<SEQ ID No.:0872;PRT;Methanopyrus kandleri>

5 LPSTGALIHVARWTVLAAALGVVGGACAVAISSIIISTVEKAVGNEPLVIPAFMLLAGSL
AALHPELRGTGMEIIVRGFPNEPANPIRGMAKLVLAGLVIGGGGSGGQVGPACQAC
ASVGGYVASKLGMSEMERKWAVLGVISGGVAGVLCAPLAAALFAIEVLRVRSRYVV
LFPSTIASLAGYSVYVSTLGKRYLLVRNAPYHYSPQHLPPELLVIAVVATLLAYVYSRC
10 VKEARRLFVESVPSQPVRSLLAGLGVASVGIAIPTAVGLGLDYASKAALGRIGAEAL
LSFLGKMVATALTVGSETPAGLVSPVCGAFLGLFWVKRWARPLRPEPRRLSLRS
WLRRSTLRSRPLCWSSSCSASTAPSRPLWERSWGISS

<SEQ ID No.:0873;PRT;Methanopyrus kandleri>

15 LTVSAEGERGPGCRVRELYSNDKVSVAEVSVRGEGEEHYHRRTFEVYYVIDGRGK
VVLNGRPVDVGP GDVVAIEPGTRHKVIGNLRMLVVCIPPFDPEDVYRV

<SEQ ID No.:0874;PRT;Methanopyrus kandleri>

20 VQPLTRRNKDEHPAVLDPDRTIVLGDVTVSRDAVIGPEVRLGPDAVVRGAVISGRC
VYNCELGRCAVGPKTTVTGDVGDGVTIHSGTILGQLRVSGEIEPPEVGEGAFLGP
GVSVLPGTVIGPESVVMPSDVVTERVPRRGVVSGNPAMPTGMVDAETLILEFDGK
RLLLEGKRGTAFDVRLSDGELEITEESP DNFGAVLEKDVVKVVRMGMHAIPLAERPF
SIPLHVLEVVRTKG

<SEQ ID No.:0875;PRT;Methanopyrus kandleri>

25 VPVRESLLIDTVRRSLVLGSLVLEMCEVERAAVLGTVAQGKRFEHGVFVAGKRVPG
EVITVEVEVSREVVRSGSMEIDLDPADPDLVAVVADVRATGLIANLTGLRPERRGFH
ALFAFSGELPARVRKRVVSNLDVFRECCPCALLEIGDVKLRFLGGRQVFDERSRLS
YTDVLAVRDGKPIASAWRPASRSVISKLGAR

<SEQ ID No.:0876;PRT;Methanopyrus kandleri>

30 VVGTVRELPTLFCESVALEVLSGPKPGLVDPISSSHEDMGPREFLACLPELRRCL
EALGLIDGEPVDELIRSLPAWNVDVITASGGPNSVRGIVFLGSVYCYSAGLENDPF
PFGRIRVGRCTEALWNRSETKCGRIRIKERLAGVFGEVASGMATARGVSLPVL
ATLRAGRPLEEAVIHSVLACMSTLEDAGIPRKLNRNWKRRASEVLRAGGPFTERGR
35 AELHKFVHECAERGVS PGASADTVVGLVLLARWGRDIVSPYRDP PRRWSGGAV
ERN SQASDTVGRNPGGRVGRREV LKG

<SEQ ID No.:0877;PRT;Methanopyrus kandleri>

40 LIRSDGTRAVASAGDEKFLKADEAEVRRELTPFEAYRKICKKLDASVVEPPEDVGHP
VDPEVGYRVLELLESLWDSGFRRLGLVLTGCGAPLHDIEVGNPVGWTSVRVSNP
GSDLDLVAPHRDYLLEMSLSGFETVKRFADRVIMSPAFTGFTVPRVEVRLPRGC

<SEQ ID No.:0878;PRT;Methanopyrus kandleri>

45 MEETGVKDVRDLCEKFLDFKREKERLEELLKEYFKRLEELERKLRAHEEKLRIEARR
RKTLEKELEMERDEKAELREELRRKEVMIEKLRS DLQRMKKPPLIVGTVEEILDDGR
VIVKSSTGPKFVSNVSPVDRNELEPGANVALNQQSMAVVDVLPSEKDSRVLAMEV
DESPDVSYYDDIGGLDEQIREIREVVKEPLKEPELFEKVGVPEPPKGVLLYGPPGTGKT
LLAKAVANHADATFIRLAAPELVQKFIGEGARLVRELFELAREKAPSIIFIDEIDAIGAR
RMRDATSGDREVQRTL TQLLAEMDGFDP LDDIKVIAATNRKDILDPALLRPGRFDRH
50 IKIPLPDEEGRYEIFKIHTRDMNLAEDVDLQKLAKITEGASGADIKAICTEAGMMAIRE
DRDIVTMDDFLKA VDRVMGKKEEESGEFKRAYH

- 5 <SEQ ID No.:0879;PRT;Methanopyrus kandleri>
VGERTVAHYGPYVVKIERTNQDNLDAIRSLLKSAERRGPGNVGEVPLDVFDTRG
LASDRTRLLVALREDEIVACVAADPRERIGSGPNPHNVFGLVVSPEVRARYQLGHV
MIAAALKTLREEGLKVARTTPIRRALPFFT GIRADPTHVYRELEVRLRWYRRTGSEE
YLELTRVPREVREELELLRIRTVNARRDPTPFHRLDPEKPVHVFRSGVRSFTLIASLG
DGDHGRRRQRDIAHVQRAREPSKGDSDRGGSGGRRLDR
- 10 <SEQ ID No.:0880;PRT;Methanopyrus kandleri>
MVDVSVILPTYNERENLPRVIPKIEEVVEEEGWTAELVDDNSPDGTAEVARELSR
QYGNIKVIVREEKPGGLGLAYRRGFREARGEIVCMADAGQHHPPECLPNIVNPVLDG
ECDFGGLGSRVVEGSVENFPWYRKLSWGARVVARLFLKLPYRDPSTSGFRAISRKI
LTESRPFVSEGFEIQVETLAKAHMGTQVEYPFLFRPRERGSSNVNIRQILRYLRG
VWRIRKDLKQRGLL
- 15 <SEQ ID No.:0881;PRT;Methanopyrus kandleri>
LRVVVVGGGAAGVVAARTAREHGADVVLISADEHIAYS PCAIPFVISGEIERPEDILM
RDPHTHYERLGDVRLGVRVEEVDPEEKVVTTEDGDTVEYDSMVLATGGEPLVPPIE
GSELDGVFTVRRFSDIEPLLRAVQESERAVIVGAGPIGVEMAYALHERGLEVTLVEM
LDRVLPQFLDDVAAIVQERMEKEGVRVLLGSPVEAIEGDDRVEAVVNGEEIEADL
20 VVMAAGVRPVTDLFESIGASVLPFGVEVDPALRVKREDGGVFDDIYAAGDCVADW
CPITGERVPSQLGTAVVRQGKIAGKNAAGGPRATWMGTLNTAVIRVFDLEAAGAGL
TQTRAEELGLEVVSATVETTTTARYYPGGEPIAVKLIADADTHRIVGVQSVGGGERVR
ERV DGV ALAIRLA AKVEDLLSWDYSYSPVARVIEPIYEA AELLREELHS
- 25 <SEQ ID No.:0882;PRT;Methanopyrus kandleri>
MKRFLRDLASAATASLTALVLMESFTGITLES LKHRVHHPEFLAML PALMDFRGNV
ALAH SARTATATHLGDEERALQSSLAVLLIGLMVPPVIGSVVYYAYGGDLSTLVGTA
FLT VLSVTAVVTPVTVGIVRMAAMLGFDPDHVAPPLTTALSDVLTVAFLFTIAEVMVG
- 30 <SEQ ID No.:0883;PRT;Methanopyrus kandleri>
LSSVWRGILRILRSMLVISIILAVWSSFTG SLLAKWEAKLEHNPGLAALLPVLMAAAG
AAAASFGRSLSTYLHLGTFTIWA VLRDALVQGSALLVIAGYAGLVTVAFSGRPSLIL
LAVESTGLTFLT SILVALGSAFTSVRLGMDPDDVVG PVVTTAADS VGII LT LAPG
- 35 <SEQ ID No.:0884;PRT;Methanopyrus kandleri>
MEKIEEEVKKRTVVELLTEMKNLAQLSVDLAYS VLLFGSPELAEVRRRIERRVDELS
MVLKAKLALAIRDLEDVRHLLPIMELTQSMEVITDAANDIAETVAMGAEPHPIVQKAIA
ESEEKIRLVRVEEGSELDGKTLGELRLASETGMHVIAIRRGSTWIIGPDKDAKILGGD
VLIVRGRDEGYRKLKKMASGRG
- 40 <SEQ ID No.:0885;PRT;Methanopyrus kandleri>
MRWETRREKIVSLLTESREPLTIEEIAYMVGEDDKSKIIEDLEHIAKTLRREGKTLME
PARCNKCGYVFKSLRVKPPSRCPKCKSEWIQPPRFTIRE
- 45 <SEQ ID No.:0886;PRT;Methanopyrus kandleri>
MKLPENVPEPPVCEKFDIGEEARVMRRSHDGYVRLGEVAGLEKFRSVCLVSVRA
DSGYYYVVPYRVTEERVITEPLRV RKIGEGVVPPIPHRR LGELFVDVRKVGSDYM
VTLYGKNLHVRTYESLTIMTQRRGSELSAGGMSIDLSSGFLKVEGVRCRPLGFHRP
DAIVGITERLEVVEIRENGSRYLGDVVAVGEFLRITLDDLSLDVPRRVIP
- 50 <SEQ ID No.:0887;PRT;Methanopyrus kandleri>

LLKVTVCPPCYGFREVCHKLAQDGEIVDVSDARRLSDITSLCDEGADRVVIAHMDAP
TVLEWLERRDRYALRSIRSKVYNVLSALLNRFKEVHVVVYSQVFLDFVPDSIVREVS
VELVKVEGSAKDILTWPPYGPCPEALKRGGTLEEMNEHVSELVEETGSTILGEIARR
DVRVVRTMYLSATEILGRICRNFREFKLGTKMLDALEAAGVLTSRNVGYRMFWSWSP
5 AAVLGRRSELVNGVLNAVLEMEGAVFG

<SEQ ID No.:0888;PRT;Methanopyrus kandleri>
MRVALRVAYDGSRYHGFQYQPDVPTIEGALRKALSELGLELVGYASRTDAGAHAR
YQVVVVEGDPELAQPDPINARLPKDIRVIAKTEVHEEFDPRRDALRKEYRYFLGPLN
10 RPEAAARAARKLEGKHDFSAFRREDGRNPIITVERCELVEITPNAYVLRVVAPRFLW
EMVRRAGFWWEVGHGLREEGDAAELLSGKFEPSSKKPRCLPAEGLILWHIEYDEVR
FERTKAWFEDHKVIQLGGRLRLRLEGAESC

<SEQ ID No.:0889;PRT;Methanopyrus kandleri>
15 VSLEKVDLERLLEHIEETNFCRRLFREVSEEWKTIIGPLQGDDATVIEVNGERLVINM
EGPYPAKIGRKTAIIHSAADVVTGGEPVAFDAVQAESEEQAEIELEDLRKQAEGLG
IKILGGNTQSHPDLPVPCVSVVIGRLIADEPIPDGTAREGDALVFLGEPVRGDVGDV
YKAKVKFNAFLRFLREGIDVSAAKDASRGGVGLGNLLEMMGKAKKGVELRSMPYPT
WTGYLGIFMVCMDPNDVERAAEIAFEEGCPFTVAGEVVDEPVIRFGNRELVSEEM
20 IEVYRRLPYKPPGAGR

<SEQ ID No.:0890;PRT;Methanopyrus kandleri>
VGRTCSGGAFLGIFSGMLSGYIPGLHPNTFFSEFDPTYLDREDVLTFAACSAVNVP
LSKVESMFLGVPDDQASVAVLIPLQRYTIEGRAEEAARLVALGTLSTGFFAAVALPYI
25 VKIVGPMYVASKPIIPWLVLTLALQTYDNGLRGLAVFSASSAVGYVVLSGPLDVASP
LEAMLSGFYAIGPGLSCLMNRTSIPKQRP GKPAISGKELPKCGILAAAGCALGFLPG
LGPANVSVLTRLGVD TTERYLLVTSGIDAADAVSSIVALHALGNPRSGASVFIQSV
GDITYPEVLASVGVYLLVSVLGAWLLIFSTRVLGGVLSGARARVLTGTVVLGLLALMT
FHGLGSLGTAIACAGIGIYALRSGVDPSLCTSAALPTALKLLGVG
30

<SEQ ID No.:0891;PRT;Methanopyrus kandleri>
MLKELWRSFAMALGAAWTLGLLALTVHILGLVWTIVLLLGISVLLGISVSRRVSPFIAV
ARGLGLLSLLMVNAARLEYLAPWLAMPVLGALYVFDPRPAFYLVIAAAGAVLLLRALIE
IHEAAVEADFRYRSKVQGLALAVREIWSGIMEALERLSTISAEEKKEELSGTFTVAGKK
35 LLRWMLS

<SEQ ID No.:0892;PRT;Methanopyrus kandleri>
MIGIVLAAGEGTRMRPLTKTRPKVLLPVADRRLLIDFSIEAMKRIGVEHLVWVVEYLAE
KVERYVKDRWGDSFELEFVRQ GKPLGTAHAVYVAWREIEPDET VITNGDLVFDSE
40 LLERAVREHEGVASMLVEVEDPSEFGVARLQDGYVVELVEKPKPEEAPSNLANA
GVYVAEPEFERFLERVKPSRGEFEITDALLDAAIDEGVLGISYDGFWSVDVGRPWD
LLDANAWALRNAMS RPEVEGVIEENVELRGPVWVAEDAILRSGAVVEGPAYIGPGC
EIGPNCYIRPATT LVRDVRIGQAVEIKNSIIMEGTNVSHLSYVGDSVIGAKCNLGAGTII
ANLRHDERNVKVVVKGELED TGRRKFGAVLGDGVKTGINTSILPGRKLG PYSATAP
45 STVVRKNVPEGKMLVQGDQILVDWEGRG

<SEQ ID No.:0893;PRT;Methanopyrus kandleri>
VGKYFGTSGIRGRVGEFLTPELALRAGRALGEYLGGGTAVVGRDTRVHCDALRAA
VISGLTAQGCDDVIGVVCTPTLGCVATEGLDAGVMITASHNPPEYNGIKFWDS
50 GMAFSPEQEREIEQIMDGDLEYPNWDEYGEVVDDETALNVHVERILDEVSDGDGL
RIVVDCANGPSAFVTPVVLREMGCEVISLNAHPDGHFPGREPEPKPENLKDLMRTV
RATDADLGIAHDGDADRVVFTVEEGKFAGYDEV LALVCRRILEEKGP GKVAVNVDA

SMVIDEVVREMGGEEVVRTKVGDVHVAIAAIREEGCVFGGEPNGTWIHPDVHMCPCDG
PLSAAWMVSLLEEGRPLSELLAEIPSPVRETVECPDELKPEVMRLVETRLREAY
DDIDTVDGVRVELDDGWVLRPSGTEPLIRITVEAESEERARELRDEFVDIVRRCVE
EVRE

5

<SEQ ID No.:0894;PRT;Methanopyrus kandleri>

LFAFLAGDNVELALMELKGALRAEVGEIEVEVHDRVAVVEGLTDEEAERVVRLAR
THAVYRVGEGRRVRVEIGGERRPVRLAEREKLSDRKPHKRPEFMPDSTEPFLARVL
VNLAEARRRGERLLDPMCNCVGGILIEAGLIGCPVGVVEVREELVERTERNLRHYRIEE
10 YELHTGRAEEVDEILDPEVQAAAVDPYGRSSYIEGGPVERLLLNTLDALSEVVEGK
VSLTAPVDAWEEVKESVKRVEGEVRDRVHGSLTRVIAVVP

<SEQ ID No.:0895;PRT;Methanopyrus kandleri>

VKVLVQPPFEDDIARVLGVRGFIPLVYLAACLEKEGFSVDILDCPAEGVEMEDLR
15 GRIRGYDAVGITATTPVAPSAYKVAKLAKDEGAFVFLGGPHPTFMDREALRESPAD
VVIRGEGESTTVEVLEAVDRWEESDLNIPGITYREGSKIVRNPDREQEPEDLDSLPL
PAYDKVDLDQYSADSVRFVPVITSRGCPFRCLFCASSRIFGPKWRGKSPDRVVEEI
SYLVEELGVERLEFVDDVFTAHKRRVREICEKMREEGIDVPWDCGARADTLTPELA
RTIREHGCRTVYVGAESASNETLKRINKGITVQDVIACRKVAKRHGLRILLSFILGFP
20 WEDREDVFRTIKFARRLEPDYVQFTVCTPYPGTPLYDLAKERGLIEVHDWSKYTTV
DPVMRTEHLSTRELGRLLQRAYLSFYLNPRYLLNALREGKFLFKRIVKSGIRAVLSY
LSR

<SEQ ID No.:0896;PRT;Methanopyrus kandleri>

MTRVGEFIRVLNRVLDSELARRLMKLGAKRCESCGDVRVKVALDVAYGGREDACW
25 KCKATARLVKKLVEKTARAAGVDEETVREALSLDSYRRGIAVTLLGIYRYGVRKPFV
PAAPYLWVDVTGLCNLRCEHCYSEAGKPAPGELDTERALEVIERFSEWNVPGLAF
SGGEPLMRDDFFELAEASANEGMFTALATNGTLIDRDTAERLEAAGVEYVEISLDGA
RPETHDKFRGVKGAWERTVEGVRHCAETDMITVIAFTVHRNNVDELPMQLDLAEEL
30 GADGIAVFNFIPTGQGRFCPELDPPEVREEVLKMLVREALDRDLMIYSTAPQMSR
VSLQMTESGEGGVLYGTHFAYAGEGRWIEPLVEFIGGCGAGRCLLAIRPNGDVQP
CVFLPVKIGNILEDDEPEELWEHEVLWACRNRDELEKPCGECKYRYVCGGCRARAY
AITGKVEGPDPGCVLVGDANK

<SEQ ID No.:0897;PRT;Methanopyrus kandleri>

MRDSPDEVSVDELVNMAVAGGIDEGTALDALQGKLDPYKVMRAAHEARLKIVGEH
35 VTFVVRNINFTNVCINRCRFAFRDPDDPDAYRMTPEEVGERAAEARDAGATEV
CLQGGLHPEATFEYYLEMLDEIKSQAPDIHVHGYSPEVVKYCAKLAGEIEDVLREL
KRAGLDSMPGTAAEIFSPEVRKRLCPDKLEADEWEHIIIRIAHELGIPTTCTMMYGHID
40 SPRDWIDHMKRLRGIQEDTGGFTEFVPLSFVHSNAPIYRRGGARPGVSGMTDVLV
HAVARLYFGPLIPNIQASWVKLGVKLAQMTLHAGANDLGGLMEENISREAGATEG
EQLEPEEIVEIIREAGFTPVQRTTLYEPVKVY

<SEQ ID No.:0898;PRT;Methanopyrus kandleri>

LITSVPTRSGLNPAHDRSDRGGRLKGNLLELMDRANRLTREKFGTVVSYSKNVFN
45 PLTRLCRNRCAYCTFRREPEEVRSPYLSPEEVFEIVEKGKEAGCKEVLFTFGERPE
ERYDEALEWLEEHGYSSTVEYLVDLCRCVVEYDMLPHSNPGVITKREMRKLRRW
NASMGLMMEILSERLCEESGPHEHSPGKRPEERLKVLYAGELKVPFTTGILIGIGE
TWEERVKTLEEIQRMHERYGHVQEVIVQNFRTKPGIPMEDHPEPTPADLLRTVATA
50 RLILPDVPVQVPPNLNRETGQLALLAGANDWGGVSPVTKDYVNPEAPWPEIEELKR
LTEDVGFRRLRERLPIYPEYVRRGWYHANISEVVERLSDDGEFAR

<SEQ ID No.:0899;PRT;Methanopyrus kandleri>

VGAGEMAEALGEELEIREIQRRWEEMDLLSKVLEKNRDGPLFYFLDGPPYASGSIHL
GTAWNKIIKDAVNRYKLMRGYRVRLQPGWDCHGLPIEVKVEQEVLSDEIECKKDIEE
KVGVDKFVEKCKEFALKHVEIMTEQFKRLGVLMDWDNPNYMTLDNEYIEGAWYTLKR
5 AHERGLLDRDVRIVNWCPRCETALADHEVEYKEVEDPSIFVIFPIEDDSDAEVDLPE
NSALLIWTTTPWTL PANLAVAVHPPEEYVLARAEVDGEEWHLIVADKLKVLSVVT
SYEIVDSFPGEALEGLRYPPLWEEVPKLRLEHEEDDRVHRVYTAEWVTMEEGTG
CVHSAPGHGEEDFELGREVGLPPHCPVAEDGTFTEDGGKYEGLYVRDANEKIVED
LREKGLLAHEDTVEHRYGHCWRCKTPIIRATEQWFLKVTEVKDEM LEWIERVEWI
10 PEWAGHSRFSKSWVENARDWCISRQRYWGIPLPVWECEECGHLEVIGSLSELEAKA
VSLPPGEPDLHRPWVDEVVLKCEPCGSYMRRVPDVLVDVWVDSGVAAWASLGYP
REDEFERWFLKEGRCDPDDPEAGADFITEGHDQTRGWFYSQLGCGVTFDTCPY
RTVLMHGFTLDEEGRKMSKSLGNVDPMDVVEKYGADTLRWYVLR SNAPWRDMH
FSWQDVRDTHRALNVLWNAYRFTKMYSELDEFDPEEHPLEDLEEHLKPEDRWLLS
15 RINSLVEEVTDAFERYHVHEAARALYRFVTEDLRWYIRLVRERWVLEGDDPEKLA
VYAVLHYTFDRLVRLAPIVPHVAERIYLDYVRAGDDPESVHLTDWPEVDDRWWDE
GLEKAMELVRKAAEAALSVRQRAGVKTRWPLRRLFVEVEDPKRLEDLKDVLARVA
NVKEVELGEEFPEKVPVAEPRPDKIGPEFRSLAGRVIEHVKDRAEEVAR SILKDGEY
RTELDGEDVVLTEEHVKVTEDLPEGWEAEFEFGGRVYVFVELDEELKSEAWAREV
20 VRRVQEMRKELDLNLEERIRVWIETDEEIAEAVEEHSEYVRGETRADELHVNEGWP
EEVDLEREWEVEDRTIRIAVVVSG

<SEQ ID No.:0900;PRT;Methanopyrus kandleri>

VKWMKVDPSEFELEFFEEIGFERKRCPECGEYFWGPPEAEVCNETPCVEYSFIGDP
25 PASVKLDVWEAGEEFFRFFERHDHEVLDRYPVVARWRDDIHLTIASIACFQPWVTS
GEVPPPANPLVINQPCIRLNDIDNVGRTGRHFTLFHMGGHAFNNHPHDDRDIYWK
EETVRLCYEFTVEKLGIPPEEKIAFKESWWEGGNAGPCFEVVDGLELATLVFMQY
EQVGGEYREL PQKIVDTGYGIERYAWITTGEPTAYDAVFGDLVDATARDLGVEIDGE
AREILGELARVAGLMDVETESDLRVLNRVARRLDLVDNELVRVAEPVEFVYGILDH
30 ARCLAFMLGDGVVPSNAGEGYLARLVIRRALRLLDGLDAEREYLLEVVERVLEDLR
GTYPELAEREEYIQDALECEIDRYTRALKRGKKEVRKRLEEKGELS FEDLVELYDSH
GIPPEVAREIAEDEGVEVEVPDDFYSRVAERHEGPEEVEEGLEELERIAVEEELPET
ELAFYDDEKRLEFKAIEVIGTYEVNGDAWVVLDRTYFYPEGGGQADRGTMRWKD
GEAEVKDVQKVRGVVFHRIDGDVPPEGAEVECEVDGERRMRLTRNHTATHVILEA
35 ARRVLGHDHVWQAGAHKSTDEARLDVTHHRRISDEELREIERLANEIVMKDLPVNRK
FMDRNEAERRYGFELYQGGVVPGREIRVVEIEGWNVQACAGTHCDSTGEIGPIKIV
GRERIQDGVIRFAAGEAALERIWETEDLLRETCEVLRVNPENLPKTVKRFFEEWK
EQRKRIERLERELVEAKLRAAPAEGRRVGDFTVTLVELEDVEVGSVAGTVEELVKE
HENLVLVAKIVSNGSCQVVVSGESAPPAGELMREIGKLIEGGGGGDERLAQGGG
40 RNP DGLTEDRLVEIVEDLAGG

<SEQ ID No.:0901;PRT;Methanopyrus kandleri>

LTGIPEEVLEEPLRVARNANMLPTPEVISKIFQDRWQKRHFLKHVLDGKTARAHLEG
YIHHDLDYALTRSNCQHD CRWVLKYGLYARNPIGR LTCVSKPAKHAEVAVLHILK
45 WLMTSQNFFAGGGQDFVNFLVAPYIAEEGLSYEEIRQLAQIMMFEATQDLVARGG
QPAFTNVNLELTCPDFLEDEPAVGPGGEIVGTYGDFEEAIMFARALLDVQLEGDAA
GAPLKFPQIIVKVRPGYDKETLELAFEVAAENGAVYFANMLNRDWRKLVGDVNYM
GCRTCLATNWTGDWEIDTIRTGNFEYVTLNLP LLAHESRDEDEFLEKIREYCEVARE
ALLARWRCVKKCLEAGLYDGCQRWKPDGEYYFRYEHTTWSLGFVGLAEAEVLTG
50 YGFWEDPSAMRLAERVLEELNDVREEFHERDGRRW SVVQSPAESAERLARKYL
EKYPDAKVRGTEHRPYLTNSCHVPYDEDVNVVERAEIEAKFHPMTLGGHITHFWLG

ERTDPRSLMKLTVRVLRNNTIGFLAITRDYSVCDRCQRTYEGVVEQCPECGRRCTI
WSRV TGYLAPVDSFVDGKKQEHKERLRHEL

<SEQ ID No.:0902;PRT;Methanopyrus kandleri>

5 MEPGFELKDV FRES PRKRGLRPG RHAFRATFR RDPVYLEYRARCEDPVGDVSELL
AERYNTPGDL LDRLQMSSLDLVV PARPYVVRGGRPF AEPEHCDVGFATRGRVLLA
LVRVME AQRGSE DVVHAAATFACAPLLQCTGYRGDEWDCVDELAPVLDAPDSRE
LSHRERSIIEFADRASLGEKFVRTRAPSV DLYLVEAVGEVEPVAAEFTDYAELSLYRS
10 DSCFLG LLVETPEGVLPADPEELLKAPEDWDVRVAVRGPINPAENPDPLDRHEMV
RLGEERGNL KQPEADVWAGVYRWEGWWKGRFRPLRSVPMSIARLVWFARRLD
LGMVPETLPEEFDVDVEAPTWEVWIEGDSTDAFEAGCAVAIATGLIMSLNVPVSS
EPTSVLHTAEDLEEIIIGVRPLREALRKLESGVSIGSTEPVRGVRVKSDDVLTLSWE
DAAHLPWWVTSLSKIGEDVAEKLVERPELIRDPEFVREYVRTALASERHAFKIFREL
15 VEERSPDFASSLLRFAASDPEMSFEVLDWLRDILEGP

<SEQ ID No.:0903;PRT;Methanopyrus kandleri>

15 LTEKVRRIVR IKATGDVVRALSRVVEEGLELSILNASVSPDAVAAEIAVQAVDDEHVR
NFLRTLREFGIEVEEIEKTLVRDEDRCLHCTACHSVCPTGAIELKGVEVELDDEECIV
CGSCTEICPV GALRIASKEGERG

<SEQ ID No.:0904;PRT;Methanopyrus kandleri>

20 MKFWIPHPGHTSGLEALLSGIDDLGRVEAVYTGGSPDEVGTGRPNLHYPRLDEVRE
QVELAHSHDVL YDVVINSTCPLRGEPTRRVAERYSNYLEELEKAGVDGVVADPFV
LKLA AEVFD RITVSC LAFVNTPEKAEFYADVATAITVDTSFNRRFEVLEELSRLQVEL
25 KVIVNEGCLLD CPYRPFHFNIFSHLYGPDEVSVYDDYYRRCIADRLEHPELIISKSPWI
RPEDLGHYLEYVDAFKISGRSHQVEWIVEV VNAYLEGRWDGNLLHILDCPRELRDV
FYVPNP EL DGAIERWKECDFRCEGCFRELADR VVEVREFKSTVVGEVSA

<SEQ ID No.:0905;PRT;Methanopyrus kandleri>

30 LSKKLLRRCAAQLKRVQDALGDDAVVSEVDLFVARCGCVGVVFMVRGVELRDISDE
VLDGLEEAGKALGVRPDV VYARVVP GTQVVIDLAVRTLCDTCRREFSGEEPRPDLK
VLRGATER

<SEQ ID No.:0906;PRT;Methanopyrus kandleri>

35 LTRRWYLCCSRHHLDTVPEDSDGIVVPVTEHGVATLLPRYPETYEVEDIVDVAKDR
GLSVQALMDFTCAGCEHLS PDGYPSLRSTLDY LASDLEVDGVVADPYLVEVLATE
YDLTVVVSHTAAVDTP EKAWHFERLGADVITVDPALNSNEEEVSAIRERSVELRTA
VGAITFRDPVAFFERNLFSHATAEGIEVDPYRNNPYEPMRERVVWEVREELFDEV
40 FILASGEPP

<SEQ ID No.:0907;PRT;Methanopyrus kandleri>

45 LPGRKSID E INRRIERGEVCVVTAEEMVEIVEDIGPERAAKEVDVVT CATFGPMCSS
GVFLNFGHSDPPIKMRRVWLNEVEAYTGIAAVDAYLGATQPSEDRGIEYGAHVIH
ELASGEEVVLRAEGSVTDCYPRESVETLITIDDINQAVIVNPRNSYQRYVAATNSSEE
TLYTYMGKLLPEYGNVTYCGAGQLNPLANDPEFRTIGIGTRIWLASHGYIIGEGTQ
HDPSSGMATLMVRGDLKEADPEYLRPVVLEKYGVSLAVGIGVPIPVLDERVAASTG
VSDADIEVPIDYGIPSRDRPVVKRVTYEELRSGKVEIEGRTVRTGALSSYKMALEIA
ERLKEEIEEGEFTLTQPVEPLPREREF RMPYRPPSLPRVRDIMTESVVTASPDESI
EDVARRLIEKEINHIPVVDEEGRIVGIVTSWDIAAAVAEGKRRLKDIMTEDVITIRPHES
50 VDEALRRMDRHNISCLPVVDGENRVVGIVTRTDITEVLRRRG

<SEQ ID No.:0908;PRT;Methanopyrus kandleri>

VECLVMYGEIAVKSPVRRRMERLLARNLEEQSGGRVKRLEGRLLVADPEVPEAIG
 KTFGVERWTRTLRVDSHDPEDVFTEMKDVNLNDLKARSAVRARRATHDAPSSREM
 NVELGDLIRRYTGWTVNLDEPEVEIHVELRPEGTFVYLD SWMKDGPGLPYGSQS
 RVVCLVSGGIDSPVAAWYAARRGCEVIWLHLDRGKYGSEVDAVERLAGKFSEWLP
 5 SDVELLIEDFEDFMESLEGLEGESARYRCVLCKREMIRRACDVCENVGAVAVVMGD
 VIGQVASQIPDNLAVIDRVARFPVFRPLLGFDKNEVQRLSERLGLFEVSKEHRPCPL
 APRNPVKSADPGKVLKLEELGVLHRGLRGSGVAGSEEYR

<SEQ ID No.:0909;PRT;Methanopyrus kandleri>

10 LCDARRGCSTLGLLDSLLGGGDEGSGEAEVREVRDEVIEVELIRGPVYFKNDSIIAA
 RGDLEFLATKPVRSSGGITGLLEKVLKAKLLGLRRYFVKVDGSGVLYAGDGGKVKV
 LEVPEGETVTVNQDRLLFTTTPADVAAQLDASVLSTGLIDMGFEGPCKIVTAECDP
 VTVEVDGGPVYVDPECLIAWTGDLTFSATWKGSADFLLGREHGEEFLLEAHGYGK
 15 VLVAPYDERIRRLERMIRRAGARGGGVVGGENYGEEYGEEYEEYEESSDEGGFL
 DDLDFDFDFTDDFDLDFD

<SEQ ID No.:0910;PRT;Methanopyrus kandleri>

MDLAVQAHKVYLLGTRGLARGDWDYPYSYTGRRPPMIDYPVLPFLPAVLFHRWLADP
 YLACTLIDGVYRSLPCWIWSILKFKGMSTPRADAAMMVYAASVPFQIVEVFSTRVVT
 20 TFSLGTAGAALILRRCRGSVLRGLPVLWLWMLSLLGNPLYVLPALLLESMEERRLLL
 ALLPAVPTAVLSTYFLTSAFTWVPPAWTRASPWEHWVAPGLGMLWAVFAASRGG
 GSVLPVLPWPILWSTEAIWGPVWPLSQLDPWRVLLTAILSSMIVVERYERLRIAYLG
 SGLSAVGFPILALMVSFQPMHWESAGTASWRVLVAGDNGFEALSPEFSGKPVYSIA
 GAFYQGASEPQLQSLTPVLVLVNDPSVCSYLYASRWEFSKAVEVTRKELDPYLRAL
 25 PIGYVDVRGTAVRRSTGRDRVSWCGRPVLTLDDAVPVKRFKVLVYGSFSLYGILWA
 KLAGALGRPPIVPGVYPRVTVMMSGQELDPNELPWTGDVLVVDKMGWREAVKLGVLK
 RARVVMRVSGGLLPWSWGADVDEV SARLVKYVDVNGPRDDALRIDSDEIEV RTP
 GRAEFVLIPWGWAPFWAVNGREGQVCPVGPYMLVKTGDKPAIVRYVGWERHQSR
 AYLAGCILAVLVSVVWAAGRKPL

<SEQ ID No.:0911;PRT;Methanopyrus kandleri>

VPETPNKVLII GSGPIIVGQAAEFDYSGSQACKALREEGVVVLVNSNPATIMTDPNM
 ADRVYLEPLDARIVAKIIIEERPDGILPTLGGQTGLNIAVELDEMGVLEEYDVEVLGT
 SVETIVRAEDRDEFRAFMMKKIGEPVCASEAVSSVEEAKEVAEEIGYPVVVRPAYTLG
 35 GTGGGIAEDEEELKRIVERGLEYSRVNQVLIEEYVGGWAEIEYEVMRDGSNCITV
 CSMENVDPMGVHTGESIVVAPAQTLTEEEHQMLRSAALHIIDALGVEGGCNIQFALH
 RETGEYRVIEVNPRVSRSSALASKATGYPIARIAAKIAIGLRLDEIENQVTGETYAAFE
 PALDYVVVKIPRWPFDFKFPEANRTLGTMEKSVGEVMAIGRTFEEALQKAIRSLEIGE
 PGLGPSPEELEADPEEIRRKIETPNDRRIFCIYAALKRGLMSVEEISELSGIDPWFVEK
 40 VKRIVEMEHEIVRRKDELLEFIRTGEADEETVEFVREVKRTGFSDEQIAELLGVDEDE
 IREARLGVGVEATYKLVDTCAAEEFAAVSPYFYSTYEEECALRYD

<SEQ ID No.:0912;PRT;Methanopyrus kandleri>

LSSDPRRPTKVPWVKAMVIGLIAVMSAKALFHEWVVATLHPTNKDRLVMKVERVPC
 45 RTGDDL RPGNVEVYAKVYGCTKYATLGYGSQDPRRILVPALPPRLMSLTVTVAGNV
 IRVFRTCFPAPFIIVTATKLPRISVNQYEIRIHSPCKILLQPTVTGLLKYFPPVFITDGKS
 TRNPTHLCRNVAIIMPYALTVMGGLTPIDVSVSVSGERLVVNASSVYAPKGVTIK
 WEPICPLIWTTYADIVWRWPYPYSL

<SEQ ID No.:0913;PRT;Methanopyrus kandleri>

50 VGAYLSSHLDHLRGHSLEMAVLAILVTALVIIPEDVPTIPYVSLISSIIKAAHDSLRS
 GELPQWNPYLGGGFPLAPTPYYLLHALGRTGLIIAILLSVLVLLLASNVNMLRVVIT

LPAVLLSLIPSPPLPLILASYALGFIGNNPLLRTVGSIGIPDVALSIELGIRNPSLPVLLAS
SACLVDCLVATFGAVPLLTSRPGPIPLLLILLITVVAILPALMALAMLGRIYDPYRWKFS
GITAILFGVQTYLHELPTALATPIILFSLVLKNFNTHLDRRISVRLNVRVSKPLRFLTAL
MLVLFIVICSVLATPRFAVVGKVVGSRTGMEYIISDPWFSECVKRVLSGHPIWNT
5 PLPTDPHMGPASLLGYELGDPRAVPPPLYPTKQLEVQPRVVAPLISSPSSWAETSLH
ALQLAEAVASRGASVGEPRLNTPTEIRGYGLVGQVYDLWWKGGTHRGLLLQVNGR
AVYERPSAWPSVVLTLMSIAVAAIETAKRKSDTV

<SEQ ID No.:0914;PRT;Methanopyrus kandleri>

10 MEIRITTILAIVMIIILNFIVEYEAPDLGKHIIYDLAIQSLKSYLIEKYGLSGSDWDPYSYL
GRPPLANYPILPFMVPVVIHKFLVKDIFLATCIGEELLRLAPIIAWIIQLNLNSAEATIA
LLAYLALYPIAILYEVKYIRIATTMSYSLAAIAVIIWNSKLKDKPIKRMFSFVLWTASLYSN
FIYSIPPLIVAGILDSPIFFLPPIVTFPVLLFASSVGKLEFDNLPESTTMGFSIFDVYDTILA
TIVVTSMTFLSLLLLNISHKKKFVIGTIGLIPLFGLAVFLSPKIHIIISISKILTQLDMYRM
15 PLIACTLIIVITPKIFSKIKLSLTTYSAIFALVSVGIILKVISPTPMIPIVVEYEFSSPAIVSHD
YRASNAHLGLFSLACPLSTLSEPTYILGGAFYQGCSEVSSRILSSILFLNSGGRECC
EQLAHPGQRHLFDEDEDIARKVLTLLPLTSDYDGADIKTIRSYSDIVGFTFSQKPTLSLW
DIIPMTSVKVIYIGSYTDYSFLWLNLVRSAPTGHFPMIPLIRPYNVERGQSLSAEQIPW
SGDILIVDSEALSYPETEKLAKAKEVIVVYSSRAFDAEPPSKVVRRLRRITHHVHVL
20 GPVHHPLHSPIVKLVKESCVKLSPIHDALHRVSNDRYVLDSRGHRFVVVPWAWAP
FWAVDGGREGQTCPIGPYMLVKTDGKHTTLHYVAWERHQSRAITVSLFLAVSIAAT
AILISVRTTEGQAEGRS

<SEQ ID No.:0915;PRT;Methanopyrus kandleri>

25 VIATLALVNAYAASIPRYQIVKGKVTYPYFDEHDLKTLQYPSVLGPAINTYLPTRTVV
NCRQIMLYGLKRVGVISIGAPVTMLPTLNVDNLTKSSDNPIVTYYGISSNPICLSFPCI
DVVKIEKDLLLIPTRNSLVAKGRGEVIKIEVVLIQGNWNIICMLPENAYSGVFTWKS
ELQPFWLL

<SEQ ID No.:0916;PRT;Methanopyrus kandleri>

30 MLSPETVVTINTIITSLPFLAAIYVIAKRPARALIQLYSLGYLTPVAVLVYGLAIPVPGNL
YAYFTGAPIFLAYGVTDALIVLYALGSALAVIFVGIDQWADVAYSASTTVAWLLRTLID
PMSPRLAVLSGALITATINALVAWYKYQAWPIVPLPSVALQFSVAVASAVTLEVTAW
WVLNKLKPSPPQG

<SEQ ID No.:0917;PRT;Methanopyrus kandleri>

35 LNVDVAVLAGGFGTRLRPLTWDTPKPLVPILGKPLIEWVIRSLPRDWHVHIAAGFSS
EKLERYVESDPLPRKLHLKVEPKPLDTAGAIKFACRDSTADAFVAFNGDIVSSLDVR
QMLKFHREHDGIATIALYPPEDEVSRFGVVDLDDDDRILDFVEKPEPEEAPSNLINA
40 GAYVLDREVLDYIPEGRPVSIEREIFPKLAEGLLYGFKFEGYWVDVGLPETYLEAH
RVLMEHECSGKSVVGARITDTDLKPPVVAAPMTELRSSEIGPYVYVGERTEINGSVI
ENSVILDDVEIIDSEVRNTIVAEGCKIENARLDGCVLGHDAEVCGCNKGVRVAPGK
EAERDLEDEWVI

<SEQ ID No.:0918;PRT;Methanopyrus kandleri>

45 MRDDVERTPDDLRAVLTGFEDELPRLSYQFILTTSYGSSSHHVAHYASLLFTHELNI
ATVSHPGRLAAWADGADLAIVVSMSSGKDSHSIARALGCEILAVTCEENSPLADLAD
YLLLLPVEREEGFLNTRTIVSAMFALCAYASELSGEDLVDPDVPDRVERRLERGVPE
DVILEMRDREKVVFFIGDKYLYVAAEQALKSIEVGDVNAFATTSDELHFHGRFFGDHS
50 ERLYLCLNEKGADLIEERSGGEATVVRPEDLGLDVPDPEDPNAPVETLPVLYLLVDEA
YGPVDTTEARSWWNHV

<SEQ ID No.:0919;PRT;Methanopyrus kandleri>

LKILFRILERTPGVDGPERFLKFSLVGLSGVFVNGLLWFLTEVVGIYYVVSNIIAVEV
SIISNFILNDLWTRDRRDPGLLNFLKRLAAFNICAGGLVINTAVLWTLTELLHIYYIA
SALFGIAAATLWNYWMNNRVTWGVLLERAHEG

5

<SEQ ID No.:0920;PRT;Methanopyrus kandleri>

MGKLFGTGVRGVVGEDLTEDVARRLGLAFGTYLGGDAEVLVGGDTRTSTDTLKD
ALISGLTAAGCDVVDVGIAPTPAVQYLVDAGFDAGAVVTASHNPPEFNGIKLLGSD
GCGLSREDEQEIERIYFEENPDRAWDVRGNRV SAPDLLNFEEAVLDYVGDFDGE
10 GLRVVDAANGAASSVTPRLLSELGVEVISVNAHPDGRFPGREPEPSEENLETTMN
MVRAAGADFGLAHDGDADRLILITGDGEFVPGDYSLAIVAAWALDEGKGSQVTPV
SSSMCVQKVVEDRGGEVIWTKVGEPVVVEELKRAEDPALGGEENGIIYPDFHLRS
NGIITALLICKLVAEVGSLDDLLAEVPKYHLHKTGVECPDDLKPKVMERVESLVEEEE
LEDVLTIDGVKLFYEDGWVLRVPSGTEPLIRVFGEARDRETAIRRVEHWKERVEEIV
15 SELKG

<SEQ ID No.:0921;PRT;Methanopyrus kandleri>

MERLEWRESSPAEFFERNREMLGFDGPIKSMVMTVHELVTNSMDACHLNRIKRPDV
RVVIRREEENVYRVRVIDNGPGIPPERVPKVFVGKFLAGDKFDPVYGIQSMGQQGIG
20 AAGVALYALITTGEPVRVLTSTDGRTAHYFEVKPDPSTNEPVVVRREKR PASRRGT
TVEVTIGDAVYESGRRGPREYLRRLHAVNPHARISLRDPDGNHVVWEPLVEELPDP
PRVLKPHPHALDAHKLLRIAERTSRRTVRTMLVGELCRFSEARVEELRERLAGRVDL
EKDPKELTREEAELIVKALHEMDFMRPPSDVSPVGESALKAALKSEGARLVSAYS
RRPLVLRDNVIQVEVAVGYGEEGDLWRFANRAPLMFRAGGCSITKGVEEVDFGRY
25 GLEEDRLLILVNVNSPFVPFSGPAKQEIGSEYVEEEVKRAVQRACRELGREVRRRR
RARLERQKMKRIDRNLRIVRKKAIEILS

<SEQ ID No.:0922;PRT;Methanopyrus kandleri>

LPVHAVVGFGYPKYDPVSWFAERSLIETLEVKTAESRCLELREGSTLRLEARRLGR
30 REMSATALLERVEEPGEVHVFASSSLKGQTV DGD TVEDRMGEYLVDPLNDVGFEV
EVHWSSAFDPLSLLPELIDTLTRLDDRVLDTLTHGVRIQPAISAVAGMAAARLPGSD
MELVPVYGAAGVEVREVLRWSDGADGSRGIILDIRRHLESAMAFNKVVDYTLDP SR
EHLEELCELTESALRELDVPDDRRLERELVIDEGALRGLADALRSNYPRKVVKEAR
KWEKPSPEDVLDRLHIESSGRERAKEYLRALSNFLARALNPFLQGLDLPKSPWKAA
35 VQLAEWLCDRGYYAASVLLLREL VYLRTVYEWAEHGHGELKEVVEEYLRLALIDPD
ARKPRGVYDEL CSTIEEVT DGEAGDPDDLVRKIEREILNR

<SEQ ID No.:0923;PRT;Methanopyrus kandleri>

VIGLFRGKRREIDYSIDRRELIEVVCEIRDVRNSFAHVREDVGRPDEKAQNLVKKVKE
40 IIG

<SEQ ID No.:0924;PRT;Methanopyrus kandleri>

LGTAGRFGGWWRSRIRPPKRPRRTGEVRRLSWVLEMIRTLLCMYVGVLIASYL GSS
EACTRSLRLVLKPVVGSGLYGHAA SLSALSSSVALYAAQDKVNSTREAVGLLLLLAF
45 PTSVATVLQFYLPVVVPAVGPA GLLMIGISVVGALLTSAFGRVLLPGREDGDGPSKIT
LVRNPWRTAHSVFLRVGPAVALAMVAVKLGEYGVTEWVERFLHPLTRSVGLPSD
ASLVVFGCLINAVGAALGADLWASGKL RMEDLALALAFGRALSLPRINLQFLFPPA
VTFLGKKGLLGATVRTLVETLANISVVLALTA FVH

50 <SEQ ID No.:0925;PRT;Methanopyrus kandleri>

VRWTPALTAIVTLLAPVSSTMVNVAMWAGDGAASNCESSLRAIEYWNANYAGTY
HINVITYASPSDWRTVLETGRDPYTGT HIDVIYVPGGYHPEWHWDPDWIDLLYHAQI

DLGIGYVGICAGAYLHAGVTHRGAIGEDLVVDGVT AIDGNRGNGYVSVLIQQNPITP
QSTWGKVY EYYYANGPGMAAEDGSVFISDNRWYKVCWLDGKEVRINVQGF GK YV
ELVSGWAMVLGWYNVKKGDKWEPRGRFVLLGVHPELTERTGAWKLLARALI WAA
GYEPKETPTKKQGPSEQTLPVPVPPICSPRSRRACGRSPRATPSCQGT

5

<SEQ ID No.:0926;PRT;Methanopyrus kandleri>

VSLRSKLADLAGLLALKAVRFGPGMGRSFGWTVIKVGGF DAVRELARRPEYGVVL
ITGTNGKTTTTRLACALLAEDA EVSCNYDSNTINAVTTGLLKGRKAELVVTEY GIRSR
EYGIPDTVCELVDPLAIAYTTISKEHFRENADKKDPFGAYFEAKRLLARPLKDGVLVL
10 NADDPRVTYIRDEKRGDPVEYVFYGLEVEIEDLTPTEEELECPACGGELDYETRYFN
HKGLYSCRDCEFSRPDPDVAVVRLKGGPDEWEVTLSDVTNAVIGERLEGKVTYEL
PLPGLHNVSVCALSYLAVTPRPEDPEGTIRRVIEGLNPLEFIPSGRFEVLNVGGK
PVGVGQGDNGDAFKANANLMLSVAGDVGACVYTTTPDEGEHPHFEMHRIILRALEPD
ELYVFPGRESVKAAEEYEEELTEEFDAEFYPIPHERMQEKVEEMRRVCEEADGPVF
15 ASGCGPEREMWEALKREL RGG

20

<SEQ ID No.:0927;PRT;Methanopyrus kandleri>

MGLRRLGLVGVGLIVLYFTLLSAEYSEFQRFLGDPWGRAVYVKLHNPDIA PGTPHI
RTLVDFAKQHGYSKILVIHNAGKIGYSHFWYHGILIIQLGWYDYRTVFAQPELGLVME
DILYGQRPMGLGIWIADRREYRSMSEAVNHVRDLES AVPGRTMVVWHGSCRNGNPL
WNLGCGAEPYFWILSAYGGRVLALTFAVLGNFAPIVFYGDAALAE LRNYDKLQALY
NSGTLNRYAVDPYLRKKPMPMGPRGVYD

25

<SEQ ID No.:0928;PRT;Methanopyrus kandleri>

VRPVLEPLAEYHSIDDELAARFMVARTLPVETTEGELEDLWKEHEEAMEEF RARW
EERPAPGDIEETSPNLLDLKLEIARKILRECTFCERRCRVDRTREDGFCRVPIKPRIS
SEFLHMGEERVLPVSHTVFFCGCTFRCVYCQNW DIAFRPTNGVYVKPESLARVIRH
RRSQGAKNVNWVGDPPTNIHYILEVLRRLDVNVPQVWNSNMYL TEEAMRLLDGV
IDLYLTDFKYGNDECAERYSNAPNYWEIVTRNHREADRQCGLIVRHLVLPGNVECC
30 TFPILEWIAEELGTDTPLNVM PQYRPEHRA YEYPEINRRPSADELEE AWEKARELG F
RYYRL

35

<SEQ ID No.:0929;PRT;Methanopyrus kandleri>

MSKLDEIMVKGDPPELLGDHLGVFTARSTERKVTKVTQDGGIASAVMIYGLEEGLFD
GVIAAVADPDDPEEPWKPRPVITDPDEVLEAAGTKYTYCPNVSVLKEAVRSYGCE
KVAMVGTPCQIRAVRKAQLCPIGMRHVPDKIELLIGIICMENFPYEGMKTII EQLCGV
WIREVTKMDIGNGKFWVYTKDGEVKSIPIDETHPFEGEPCHVCTDYCAELSDLTAG
SVGSPDGWSTVIVRTEKAKEILDDMVEQGLLEVKSIEEVKPGLG LIQKLAQVKKNKN
40 QKEIEERKELGLPEPGKVHESL

40

<SEQ ID No.:0930;PRT;Methanopyrus kandleri>

LVRWWRRLSRAKTKSTPRSSCDVAYVQLAGCCGCLVSLTD TYERLLDILDSIELVYC
QTLMDEREIPECDVAVVEGAVCLNDEHMLEEVEEEHADTIVALGACASTGNFMR
LSRGNQQAAPTHEAFVPLTEVADVDYAVPGCPPAPEAIKRFLTLLLEGKEELLE PFA
45 KLAEGKTEYCGCDLMYHVVNKSMCMGCGTCAAACPTRAIEIVDGRPVNENRCIK
CGACFTQCPRTIWP GDEAIKELIMGGE

45

<SEQ ID No.:0931;PRT;Methanopyrus kandleri>

LAEGAVEIQPTTRHEGHAKLVLYVDDEGYVERAFYLN TSAVRGFEALAKGRPAEFV
QVAVMRICGICQATHGTASAEAFERAMGIEPPKDGKLLREL CALGNRIQSHVLHQLL
50 VLDDFVEDESEKVEAVKRIQQIRRIGQYVVDVVGGE GIHPPNIRIGGMAENISEAARR
KLYRRLREARELMMEQHEFMVNIVERFGDENDLDIDEFGRHDQPFLATHPTYGDPD

50

RLDMDRVVELLPYEEHKEVAYQHRGQIPLYDGVPEVGPVRARYILFDGVDPR
 GVLVIHVLRSQETLAAIDRAMTILDELNTSGKTLAEWEPKAGVGIGVHEAPRGTNVHI
 AKVNEKGIVEDYRIIAASTWNFPVVEKAIEGENEEYAEVIMRCYDIUASCAAHVVKEV
 RDADSREKIRESVVKLA

5

<SEQ ID No.:0932;PRT;Methanopyrus kandleri>

LSQSVLIVDALGAGKGWRTRSRDVIGAGPRTVASLLES DYEVSLITYEDLQKLGLDS
 VMDYDTVGVSIMTGDERAARRMFDHTRSRTFRFIGGPGAADPNALLKTGADA AVIG
 EAEETLPELLEERGVPVRGVYFRRGTEVDFPGPRPISRFRTRVNPEYIRAYAHWAA
 10 RVYVEIVRGCSNSCRTTFELPDGRKCSGCGNCREGEGGERWECPEGIPPGCGFC
 SVPSIFGPTRSRPLNEVVREVRGLVREGIRRVVLSASDVLDYGRGDLLTDPRTPPPN
 VEALRLLRRTSKHVDVLFVENVKACLLNREIAELLGEYCRGTSVSVGVETGDPRL
 RAIGKPSTLKEALRAIRLLRRAGLRPHAYFVYGLPGQTMKSAKLTAKAMKRAVEMG
 AEKITVYRFRPIPASAFGDFPPGPSRPNDEASRLIADTARRLNEALKRRMIGKRIRVY
 15 VAEPDLRRPRDAIGWPVKGGPKVRLKGARELVGTECEVEITGVVSDKVVS GKVVRI
 LEEIDVEALEGRGVPG

<SEQ ID No.:0933;PRT;Methanopyrus kandleri>

MKLKIWSPVRLFGATPGAVVGISLTDIEVLFDPGGWRPGYNRRVPPWAELPEDLKS
 20 APGLFSRFGEPYPDYTLVTHHHTDHAKHGGEYGEFPAHPGAAERIERRFDYRPED
 PNRCEIVVETVETGHCPGAVAYLVELDGIRVLFTGDVSPETFLDARLPRADVLISECS
 GVPGLHLDVGLLELLCRKAKPRIVVPVHLIAYDPWFVRELDVDAAVIEPHLGLSVDLE
 PALNAEVPCAREYHLCTRCEGRGCPVFRFVRHLRCPECGNPPTLDGEDPESVRL
 VCPRCGTRSN TVDYAEI KAVA EYAMERSDVG DWSPTEARPGEYSSSERRLKEFSP
 25 RPPGGGEDRNV

<SEQ ID No.:0934;PRT;Methanopyrus kandleri>

LRVSEYLA YLR SKY G I R P R R L G Q H F M V D D N I E F M V E A A E V R E D D I V L E I G P G P G L
 LTRYLMTRAGQVIAVELDGRMVEILKRELGEAPNLEIVRADFLEYDVPDDVNKVANI
 30 PYNISSPITFKLLELDIDVAULTYQREFAERMVAEPGSKKYSRLTVMVNLLADVLLR
 GVPRRAFIPPPRVGSSVRLTPKSEEERPDVDPDTLESVCRALFQHKNKTVRNALL
 LSAHEWATDREQAREVLEELPEDLLSERPLHLPPERVAELAAAI ESALG

<SEQ ID No.:0935;PRT;Methanopyrus kandleri>

MKVSLAGQTV DVKILNEIPKRTVTAALLEGGEIVAVEEADDEHAERKLVR RH DVEG
 35 KVVFTARPCLYCARELA EAGVAGVYLG RGRGLGPYYLARSGVEVVEVHPDEPL
 GYDPVDRLDVLLTFGGNPYLTEEDVAARVYCLLTGRGFDADIAPAPENLSGRVEIMV
 TRGDPDEAVELLKEELPVFRIRRF LISGEFDRDELREILEDIEPRILDPFAVRARIAR
 AGAFSSSREAEVFIGDVLTSVGREVN LNDPRTVTVTVL GPRVSVGVEKR
 40

<SEQ ID No.:0936;PRT;Methanopyrus kandleri>

MPERLYVRDYMVVGVAQVRMTDTVRDAVREMARAGVHGLAVVGLDGELVGVLEE
 EHIMDLVVERRGDWADILETPVEKVMNPEPAIV

<SEQ ID No.:0937;PRT;Methanopyrus kandleri>

MEEADNPVLNLVACL SRAFDSLDSAEIKVPEGCRV VWHGEHLLILSKDESMEVRLN
 45 VPENVTISPRVAEGPMEIRVHVEREEEPERGLEDRLLSAVREFRRRLRELSVSTSR
 EEAPSEVAIPPIFEVDSPTLLEYSMGRISYVFGRTTELKRALFALAKTATVCAAR
 NAVSSPTNLVEEVEADTVSPYLRVGREIVELDAIPANRVISLKKIPEDVKVWWLNV
 50 KYLPRVMAWGV DGTAEIGWRSSDLAVGYVDIQSSLYAHFLSALLNVPLDFDSYMW
 FLQRRTRKRSKRKLWKDEKGECYVFWTQMEAFEKLGVEDVILLCTREECEGWVTE

CVREDTDVRVVEVFEEDTRRMGLRVEELALTLGEEIHDRHPVTPEHPRIPSQLGSA
PELPVSLDTYLTVAKMAEERILPIISSE

- 5 <SEQ ID No.:0938;PRT;Methanopyrus kandleri>
MILGISGSPREGNTEYLVRIALEAAEEVSGETEFITVRDLDISPCEACGECLETGEC
AIDDDMQDVYELMRECDGMIVGSPVYYGGVSAQLKALIDRTRPLRINWELKDKVGG
AIAIGGARNGGQEHTLRDIQNFFMIHAMIVVGSDPTAHFGGAGVGLPEPGDVEEDE
TGietarNTGRRVGEVVKLIK
- 10 <SEQ ID No.:0939;PRT;Methanopyrus kandleri>
LRRVILWNPDDPASKNIAESLTEDAELKLTEDLQHYTVETWERDGVRFHLTAALG
DLIEEDEARELARKFDVIVFASRHESRTKKPSLTVHVPGNPTPEAKFGGKPLEVCTA
DPAGMKAALLELKRFRDKRGLDYDVCYEVTHHGPDPGAPCFFIEIGSDEERWTDE
EAGEACARILAAVDPPDVKAUVGYGGGHYAPAHTDAALSNRKLAYGHIVPDYAVD
15 HDYLRDQFREVVDKTPRAREIIVDDRNLD SGIVERLEDLVRDRGLRLRDVEEVK
- 20 <SEQ ID No.:0940;PRT;Methanopyrus kandleri>
VLSREEFARRLEELPDVADSVPHRWQELGDVVIRLFDERAWAYRREVGRILREV
TGARSVALRRVSGTFREPVGEEVAGDRNAETVHRELGIKFLDPTRVMFARGNLE
ERRRLLES DLGKLVFDMFAGIGYFTLPAALAGAEVIAAELNPVACRYLVENARLNG
VEGRVVRVFLGDCREVARFVRAADRVL MGYLKGT LKFLPYACRAVRDGGVLVVEHV
FQKRWGEDRVAREVLNALPDGFEGEVLEVRVKSFSPALDHYAVELVRRRR
- 25 <SEQ ID No.:0941;PRT;Methanopyrus kandleri>
MRVGIALSGDVPGAERVL EAVRADVDVVYHNVELDADVEEVRAKDPGRALVE
DLVEGRLDAAVRGAVSGRCVRELVDALDPFTGRSTVLEAEGRRVLLAPVGIDEGW
EVESLVKLGELAA RFHRLTRREPSVAVVSSGRLED FGRRSEIDRWLADGELVARL
LKERGMEVEHV GILVEEALERDVVLFVNGVLGNLTFRCLSLVAGFRSHGAPVLAAL
RGVVFVDT SRAQRASGYARALRLAAELAGG
- 30 <SEQ ID No.:0942;PRT;Methanopyrus kandleri>
MSRVVLAYSGGLDTSVCIELLRERYGYDEVITVTADV GQPEEELREAEKARKLADE
HFTVDCVDEFVCEYCWRAVKANATYEGYPLSTALARPLIAQKVLEVARVDADAVA
HGCTGKGNDQFRFESYLRAHGEEFEIVAPVRDLNLTRDEEIA YAEERGIPVPVDV
35 DSPYSVDENLWGRSIEGGVLEDPSEEPPEEVFEWTVSPAEPDEPEVVEIEFEDGV
PVEVDGRDDPVEIVRYLNETAGEHGVGRIDIIEDRVIGLKSREVEAPAAVTLLAHR
ALEAFTLTRRELSLKASLEEEWARLVYDGLWFNPLREHLEAFFDSTQRHVEGTVRV
KLFGKSATVISRES PRALYEEELISYEEKQFDQRTAEGAVKLHGLQERLALRRRG
- 40 <SEQ ID No.:0943;PRT;Methanopyrus kandleri>
LSWRVIAVRDLRAWLKDRRLAPTLIMPVITILVMYGAFHDVKPRHVTVAVLSSHSSD
FDPVLDALKSDDR VGVVHVRSDVDEGKTMVKEGRAVVFVYVPKGFP SDKATVYYDP
SDPMGSNYVRGVIQRAWVKRVSEEMKKVVRDLQA AFRWMPAPQPPISRVPGNPF
DFEAPVKGLKYFDLVPGLVVLTA TMGSIFGMGRVMMEEIETGV TYALFAAPIRPRD
45 VVIGRFLNMSLWGAVRCGIVLVTALALGAKVPHPFLLLG VGILSTATMIGFALLMASL
AGRSEVAEMLTGALTTPMMFLSGIFMPPSVMPPEWAYEVARVNPMYYMGDAARKA
ALLGYLDPVDIAVLVVFATVFIATGAMLYDRIREHL
- 50 <SEQ ID No.:0944;PRT;Methanopyrus kandleri>
MPPAIVAEDLRKEYGEVVALRDVSVEIEAGELVAILGPNGAGKSTFIKIVCGVTRPTS
GRIEVLGGDPADPEIKRRVGIVPQQGGGLYPEQTVRENLRFY SKLYGREPDPEPLEM
LEVDRFMDRKAGQLSGGMRKRAAIAITLAL EPEVLVLDEPTNELDPMARRDVIRVTK

EFHRRGTTVLVSHDVYEVEQLRPDRVLIFLEGRKELDEPFDEVMERHGSVLEAYE
GVASCPGE

5 <SEQ ID No.:0945;PRT;Methanopyrus kandleri>
LITSHAHVPIPSDPVERIRALRVLREAYRRGKKPSLEVYRTMGGSTCGPYVVARW
RRDSRFKHGRTLYLGKPENESVRFVEWLVS LDRGEVLELARHLMRNLRSVLKTLLA
EVSDLPHYKRARRVLARGLSLAFNARPSESPIRDLLEELPDRLESFLIRTLGGWPAH
YSIHLRKVIRSRKRS LDGRYEIPDVGLELEHWRLRHGT

10 <SEQ ID No.:0946;PRT;Methanopyrus kandleri>
VISHVGIVTIIILISKLISPSRKRFYRTLAFVYAVLGFIPPAWLLGGFACHRINLDLRE
RGCASERHTPRYAVLTILTGLYQSYWWYVTTEDVNRCLRE

15 <SEQ ID No.:0947;PRT;Methanopyrus kandleri>
VVTIPALIVLFTVLGPVAAAGPVNLSQTS GGERVIVAFNPDDPNAWSAVHRHPVGLER
GPWAGNFYDARCFPNEVTTHGTFVFEKSGGLVYGLKVEPGDSITLPEPASVVSVA
YAAVCWWENGQPFKRVTLIVEDSHGRQATTS LTLADWCARAFSPHAPDHNFLVCE
FDHRLSVEERKIRFFIIPGITWKWRVAGLKCGVWAFRLSASELGLRDITRIEFYGD
GHLIYLAVTITPTGPFDDIVGGPNCSGTTVGPDMDEVGSCYWEGEWPARFGHTT
20 VTANGVPFLIPPASGPNALLANGRLVELPRPARTVWFLYAATNWWFGDKPYGPVDL
VVVDDRGRVTARVLLVDWCAHDVVPNNIEVLAFNHRAIPGGLQSIHCGVWAFELD
AGQLGLPNIAVYFSPMGRRKVWILGATLDGQPVGLGELRPHRISHPWSGFKRGV
VYPGETLDGTFLLPSECRKVQRTPIEGLADGNAERPLELEDGRGRERHLRTRG

25 <SEQ ID No.:0948;PRT;Methanopyrus kandleri>
VGNDIVPIELHTRAFDAVGTRIILPEDKHVTAVVLYAATCWWDKDGNPVDVAPMTV
CYDDGSAYSTSVGIIDWCATDPRAYDDEKRRVAAACAVLPQLEAHWVRGEPLVYQ
TPTLVFPKRVFADGREEPNTKRPI LWLLKFPPDKRPTWIEFGYHPGHLWVLAITV
RTTDGKYYALDKDGRDRLGEPEQKVLEPNNGGELLTADTSGSLFGTSVKVTAEWC
30 WPKNAQVEALNLKFEWPLTTTALGSALSVTVRVP SGHLLRDAIPTDDWYWKWLRD
QLRDEIIRSADNELRSLSLSEEEKEIARRCIEYSANLTANTARGDAFAALT LVALYDRL
ASRIAEKLGHVHYRAVPAYVTVLTAWRADLWAILEHVNERISKH SKVLTSLALPKGY
DTLRHIAFTQFLIYQPTLGLEVYGPSLEARAVNAVLSLLPGLEQTILEIGRGASVAEG
DRVDVDWQEV RDKLGNLREIGIKDPEGTAQEIVEALKYLT ELVKYEDMDERLKSA
35 GVQRYVDPFLERVPIFNRTPSLEAAVLSYTDVATWTTTIYTLFPVPSKGASTPSGC
FCGPMTDNLKRFWNSLADSILYFLAYHALGNAAISLAILLIGGAIGEIAAGVLT VPVIVA
AIKAGYFNDWSDWNKLKMFANETASTAPASFTAKLQWAIHCYGGGRAKAIATTVSF
AFAYLSSVCTGAKLP

40 <SEQ ID No.:0949;PRT;Methanopyrus kandleri>
LYRGETAVGGSRVGDPWEELERFSDPELLEFSKRLDVELSGEELKATKRRVEHVES
LKIKCIIVIPILALVGLAINGKMLSILASIYYEYPAYALTHAAVLAWDVAVIYMLRPGLY
RKEKRALELALRVKKPVLAYFSLYHPLTAPLAGFIILIFSSYKPLHILYKNPKGAIIMVIA
YHVQIFIPLISYLVRLRTRTPVILSYSLIVTKFAVGRPVAVEKLWQEAREYRPLTLPRVA
45 FIGVSLASTIGMLLLIGLVRLHIEYSTKGIETIARMAPLVTLGVTPIVTKARNLLARVP
PTTIAEGILTALNVLA AFTYTIPFFVILLYYCLP

50 <SEQ ID No.:0950;PRT;Methanopyrus kandleri>
MELERVAEFELEDIKVVLRGDITELNADAVVNPANSRGVMGGGVAAAIAKAGGEEI
EREAMEKALIPVGEAVETTAGDLDAEYVIHAPTMERPAQRIGVENVREATEAALRKA
EELGVESVAFPGMGTGVGGVPYEDAAETMVEVIERLAPELESVRAYVLVGYEEELA
EAFRRALERRVG

- <SEQ ID No.:0951;PRT;Methanopyrus kandleri>
VNGLKPCSVRALPVRGSDRVPWSALAVMMGCFVGFHFLSELLVDATVGLARKYG
LSESVAGATLAAIGTSAPEFGSSLSSILLEHPNVGVGTILGSAVYNVTVIPGLAALAAG
5 GLTLERAVYRRDVLFYLLALVVLVSLWDRVLRVEALAWVALYGLYVLLMRRTDE
STIGAEGDTGEASRLSLVVRVSVAVVGIAALS DLMVRATVDFCEGFGLSERVSLLL
NAAGTSVPDTLASVHAARRGFGSLAVSNAVGSNTFDLLVCLGVPLSLVSRTPVHGE
LGATVLALVGCVVLLYLTVTDGKLRNVEALALLGAYAAFVACLLVL
- 10 <SEQ ID No.:0952;PRT;Methanopyrus kandleri>
MGSRTMSD GALREWEGR TWEEVDGKVRCLVCPRKCVIPEGGERGFCRVREN RDG
ELVLLIHGKVSTAVPDPIEKKPLFHYKPGTDVFS LGTVGCNFRCRHCQNWQISQAG
PEEVPLEEWPPERIVGA AKRTGCESVAFTYNEPIIGLEYTLETFEACREEGLGCVYV
TNGFATRRTAKILGEVLDAANVDLKAFTEDFYRDVAKAWLKPVLRTCKIWKDMGVH
15 VELTTLVIPGYNDSEEEARRIARWIRKELGPDTPWHVSRFHPDYRMLDVPPTPVETI
EKFVEIGYEEGLYYVYAGNVP GHKYENTYCPECKEPVVVRRGFSIVKMHVTDDFHC
EHCD AELHFVT
- 20 <SEQ ID No.:0953;PRT;Methanopyrus kandleri>
VRAYLELARPINCAMAALGVVVGELIAGARLDVGAVLAPVVAAVVCAGGNAINDYFD
AEVD AVNRPD RPIPSGRVSPRSARMFALGCF AVGVGMATVINRMCLAIAALNSVLL
YLYSWRLKGTPLIGNVMVS YLVGSCFLFGAAVGQRPAPAVWLFLLAFLANLVREILK
DLEDVEGDAALGLKTLPIAYGEGVALRVATVFAIALAVLTPLPYLDGVVGWPLYLV LAL
PAAAVILLASVLAVAGSWDAGKAQRVVKVGMLLGLLAFLASLL
- 25 <SEQ ID No.:0954;PRT;Methanopyrus kandleri>
VVSVAEEKVT VSVIKADVGGFPGHSEVHPDLLEACEGVLEDAVDEVIDYYVTRCGD
DIDLIMTHTRGEDDEKVHELAWN AFQEATKVAEDLKLYGAGQD LLSDAFSGNVRGL
GPGAAEMELVERPSEPIIFCCDKTEPSAFNLPLFRIFADPNNTAGLVLDPSMHDGF
30 EFEVHDVIDQKKVILKCP EEMYDLLALIGQTQRYAIKR VYKKGDGDEAERIAAVTSTE
RLNLIAGEYVGKDDPVAIVRCQSGFP AVGEVLEPFTFPHLVAGWMRGSHNGPLMP
VSEEEAHPTRFDGPPRII ALGFQLRNGELVGPQDLFADPAFDRAREIANEVADYIRR
HGPFPQHLLSEEELEYTTLPDVLKKLEDRFEDLEE
- 35 <SEQ ID No.:0955;PRT;Methanopyrus kandleri>
LFPGGKIDPRKLQRLMREMGMEQEPISGVERVEIHLKD GSKLVFEKPQVIRMKIMNQ
EFYQVAGKAKREKPEEEPF TDEDVKLVAEQAGVSEEEARKALEETGGDLAEAIMRL
QGE
- 40 <SEQ ID No.:0956;PRT;Methanopyrus kandleri>
MSRYVEIVRGILAYQFGREAADAML DGEVKVRVRRGRPREVFVDGKRLCTVRASD
GLVSLAPEGARRLHAATEPPEHRVVCAD EWVEAVRRGRDLFCEYALRGWEELRP
GDECLVSEDELLAVGKMRLSGWEVEYFEHGVAVRVRRL
- 45 <SEQ ID No.:0957;PRT;Methanopyrus kandleri>
LDPDVLLRHAE EISDACVVYALEGELVEIEASNGELRKADSDRVRTYAVRVLKEGSW
GVASGPDPERDLVERALRSTGEGSAEIP EEPVAAEGSYRWEGKLSPLDSLDEAAEL
AVELSREVS YDCEITYSAGSVRYTITSTWGSECEVRLDCVNFGVKVSGKGTAGREE
YTERD GANCAGLELFLERAE EVRDEAVRRLEDLLEAEPGP ERAESVITDP ELLGVIV
50 HEAFGHAVEGDLVARGESVLQDWVG ERVASEIVTVVDDPTERGAFGSYPFDD EGV
EPRRTVLVEEGVLRGYLTDLTSA AE LDLEVTGNRLESIGDHVQVRMSVTYVEPGD

ASREELFEEAGDGAVYLLGSKGGQTDATGNFQFSAKLGYYVEEGEPSRPVRDVG
LTGETLEFMKRVRLSDELRLHPGYCGKGGQLVPVSDGGPHALVDGPFHLRSG

<SEQ ID No.:0958;PRT;Methanopyrus kandleri>

5 MALDDPLSQFEPGRAVLLEVETERVEVERTHDTGDRGRVSADRTIVRVSTDGGL
GVATVADPGEVDTAVERALASAEMGTSEPVEYPDSDPARVSSCDPSAVDEDELW
DLLEAVVNEVSDDVTITSVSVTGVRRRVIFRTPSDQAEREESVTVSLDVIGEFSGF
AWDTAVGPRDIDPELLAREASEMASEAPKERVSGGELAVAFHPRAFSELLTYVLIPA
10 LSGLEVLKGTSGFDRGDIGRKVGPESLRVNDPTLDRRPGSYAFDDEGSTPKRME
LISDGILRSFYTDLYSSRRLGMESTGSGLGIRPEPSPANVIVQGDASEEEVLEEADL
IVYRTLGAHTASKVSGRFSVTALWAETVEGRAVPVSVRGNLYSSLRDALISEETERT
GVVEPPYALLRCRVG

<SEQ ID No.:0959;PRT;Methanopyrus kandleri>

15 LDPLTEDDVELREITLMVPIAEANLISNHKFRNRKRDAAYASYLVGSSSTDVDDVIPV
TVRIPWPKDVKAPREMPPLVPGTLTHHRRFCFTVPNPPETRKLSEKTLVTAALLRTL
HELDLTSAIRY

<SEQ ID No.:0960;PRT;Methanopyrus kandleri>

20 VADVKIGFEVHVQLDTRTKLFCDCPTDYEDAEPNENTCPVCTGMPGAKPLPPNEEA
LLIALEIAHMLDCEPVLDRPLYFQRKHYDYPDLPSGYQRTSVPIAVNGELDGVRIEI
HVEEDPGRWEPSTGRVDYNRSGVPLIEIVTEPDMRSPEEARDFLRRLMQVLRYS
KVKGDDGGIRVDANVSVEGGARVEIKNINSIKGVYRALRFEIQRQLNLMKHGREVRRE
TRAFREDQGTVMAMRSKETAEDYRIPDPDIPVFEITEDLWEKAVARAPEPPHRA
25 RRMAEEYGISLEAAEALVTEREWADFFEEVVEKAPDDWDIEFIDQWVRKEIKKILNK
KEMTFREAKITPEEFIELLELVREDKITRQNALNALWEAVDSDKSPVEIIEENGLLKVS
DEDRLARVVEEVIENPQAVEDYKSGKEEAIHYLMGQVMRKTGRGQADPEVTMRLL
RERLSDSG

<SEQ ID No.:0961;PRT;Methanopyrus kandleri>

30 MGVGGEVDNIGRGLLSEDRRAREAAARYREWAESLDEEELFRYVRERTGGLGHGK
EGFEVGKMGKGYVIAWPEQARGMVLEIGTGLGRTTWALLRWGDPELIVSVEVDP
RMLAIALYRNPVPEFSEALRDDRVKILLGDAVEVVPKLPRGFDHVVDHGGPCPGRN
PRLFSPEFLRTIAEKLKDEGTASVFAGRDPRWQDRIYRALSRLFLEVRAESFPDPTT
35 VVFRCEGRR

<SEQ ID No.:0962;PRT;Methanopyrus kandleri>

40 LPEDPLRGYEPSVRDYLARCDTDEEALVLQYLVKRGELDEERASELEREIREKGV
RSLVERRHFGYYLERYDPEERRYRG

<SEQ ID No.:0963;PRT;Methanopyrus kandleri>

VERSAPVAGQFYPADPEELRKMIEWCFRHELPGDLPETNDGPCTLPGVVAPHAG
YQFSGPVAAHTYKVLAESEGTPEVVILGPNHTGLGSAVATMTDGAWRTPLGSVEID
SEFATALVRKCGVMDDDLTAHANEHSIEVQLPFLQYVYGESFRFPVCMAMHDLQT
45 AREVGEAIVDVAEELDRNTVVIASDTFHYEPHDQAQKKDRKVIERITALDEAGMIEI
VERYNVSMCGVGPTAATIVAVKAMGASEGELLKYATSGDVSGDYSQVVGAAIVFR
RG

<SEQ ID No.:0964;PRT;Methanopyrus kandleri>

50 MHPIESLDLALTALIAGLILTSEALRFPFLSYLVRVPLRPITLVLALAALVLTFIPIKGY
VPTLLTLLCSVKLSIGGYLLSRVWVVSGLRDGLIGALRLSLEIRTLPDFLSVGCAL
TASGVLGVLRWMTSVPVAVPW

<SEQ ID No.:0965;PRT;Methanopyrus kandleri>

VEMEREFEEALRNSKTFLRSIDRVITDYPKWRTVVVDLEEFDEPDIAFAVSDDVVEA
MKVVQRVAMELIKKEPDPVDRVWVEFRGSPIRLRARDMSVEFKDRLVTEGIVRRV
5 DNVAEEVVRVEAECPCQGNRFEVRRREYRPDVRCPNCGMRCEPDELFYTDYQLV
VLQEAPEHVRGGEQPATVEVEFRYDHINRVRPGDVRVTAVPRVRLPSSSPRPGD
TGEIVLEAHGVERSDSPLPEEDLRFTQDEVERFEELAEGDPLGEFVEAVAPHIHGHE
VIKAVSLQLFSCVEEGQIRERVHVLIVGDPATAKSQILQHVEHLAPRGVYVSAQHV
TGAGLTAAARTEDGWTLEAGAVVMADGGVIAIDELDKASRGDLNALLEAMESGKI
10 SVAKAGITTTLNARCAVLAAANPEAGRWQGGHPHIEINLDPALLSRFDVILFTRDEPD
PEQDKLVAERMMEAFDGEFDEIEGKYELLRRYVLYATKEFPNVTISEDAREELRDW
FVSARQEAADRIDEGLRTVPVTRRQMGSVLRLARASARMRLSETVGRGDVSV
SVVEEFMKEVMQEDGVLADVIETGKPKSVREVREYVLKVVRKLAKKHEDGVPKR
EIVKAVKHRVSRERVEEILDDLVEEGSLLQPRPGVYLPM

<SEQ ID No.:0966;PRT;Methanopyrus kandleri>

VNGWLNMSSELSRRYPVAVRVPAGELAHSEPTEDGFVTPRGVRFHRLVVGVLSSGR
YVDEEREFVITVTDDTGSVDVFAFDECYEPARTLDKWRQIKVIGRPMPEPREEGRP
VALRAEVIRLTSYSEELFRRLEYELMAGGEVPTVEKPPTLDEAIEMVYKELLEREET
20 FSREELYEVIRSVVPLADEEFCEKIIKEMEERELLYPMDLPGGKRWSVIETGWGL

<SEQ ID No.:0967;PRT;Methanopyrus kandleri>

VVEYDYEELLERAYEQLPEEVLEDRRFEMPKPKVSVGKTTVIRNFKEISKKLDRDP
EHITKYFLKELGTAGHVDGGRILHGVYHPKLVEEELKNYVEEFVLCPECGKPDTKL
25 VREDRQWILKCEACGAWSVRRLK

<SEQ ID No.:0968;PRT;Methanopyrus kandleri>

MARVLLNIHGTGDTVVLLALCDEDLLGVELKYKGRTLHISEPFYSGKSLEPDRAAKKIR
EAVQEYEDEKTVAINALGELACSVVVDAGLAREDEIGELGGVPHVQIYILPREPFL

<SEQ ID No.:0969;PRT;Methanopyrus kandleri>

LTSGVLCTTAPGLEDVCAQELGEITGKSVRENYLGVGRVLEVCSEHEALDLAREIN
RRSLTVHRAAVLLGGFEIEHRDERGLEEIRERCRELPFERYIHEHDTFGVRPSRLGE
HDFTSVDVGAAGDAVIERIKREEGFRPQVDLDAPSVIVRADVVGDTVIVGVCTTGD
35 RSLHQRGYRVYDHPAALNPVIAQGMLELAGDPDSLIDPTCGGATVPIEALLRDPETE
AVGVEKFRTHYEGARLNVLAARVDVELYLADATRLFEVPELDRDREFDAAVFNPPY
GLKIANPRVVKTLRYGLARVLSDLVSVVVTVTPRDGWMRAAMEEYGFRLSHDRWV
RHGGLDVRLLVFR

<SEQ ID No.:0970;PRT;Methanopyrus kandleri>

MRSVGSPPMIKAVLFDVDDTLYPSSKLAEEARRNAIRAMIEAGLETDLSEEELYREL
QEVVKEYGSNHPRHFDLLRRIGADPEPKLVAAAVVAYHDTKFAYLKPYPDVIPTLM
QLREMGFKLGAVTSGLAVKQWEKLIRLGIHHFFHEVVISEEIGVEKPNPKIFIEAARRL
GVKPEEAVYVGDRLDKDIRGANRAGMVTVRIRRGKYQDMEPRNDDDPDFEIDRP
45 RELLDVVRELAKD

<SEQ ID No.:0971;PRT;Methanopyrus kandleri>

MGGLPTLRIEPVPLERKVRPGDDLAELIAESAELEEGDVLAIAHTVVSKAEGALISLD
EIEPSPFAKTLAERTGKDPVVEVILREAESIVRVGPDFIITEVRGGMVCANAGVDES
50 NAPPGYVIVLPEDPDRSARELRRRLRELVGVDVGVIITDTQGRPFREGVVGVAIGAS
GVPVLADRRGRDLYGRELKITIVALGDLLASAAELVMGQADEGTPAVIFRGLKPEL
ERFEGPRKARAIIRSPSRDIFR

<SEQ ID No.:0972;PRT;Methanopyrus kandleri>

VAVFHYPHCENTASGITDVIKGLGPNGAIEFVGVBHGTSHSIAGLPEDVQKMEIQYC
WEFLEDQQLGPYLKDIISPSEWIMDDTFVKVCQELGTREVVCGYRTWELDPDKH
5 PRWYGKDYDYIADIMVIKLNNTNGYTVYVCPVIDFEELVGDVDELGVYNLSNLKTM
LRKAIETLRNTGAIRDGSHLMMWVLIHPWQLTEDIRVGRNDNTRPGMELIEEFIQWV
KKGQLDYEVNGINIKFVLENPSDAIRIERNIEQNPTAYGHPMVTVTKLDWVSMIKASG
GKTARELKHHDHQLVDIWERAMKKLQKVAPQLSSLRQTVDRLVYDVVLRATNEFRL
SVMATKGDFWGTKYDATQYVQMWEREIQILEGADSGDDPVRGNRVGPGSPGDGV
10 QAGRSDHQGTVPREQVVLVTDYPHGGASERSEDRLRGRLRGPDDPVSSDHPRME
DHRRRDRDQGPGEQRAGQGEVRSQQRSERGAGQGGEARGSRFVPAGVPGKDR
GGVRETRDLADTESDDHPDDERYLHGQASSGVGIGRAQGEGHLGITGDVGGQLLG
DH

<SEQ ID No.:0973;PRT;Methanopyrus kandleri>

VTTENCDEVESVTIELLRDGMVDRKTVSSPQGSVEFTVTEEGEYQVRIIVECTRGVT
AETLTNSVTVRFPSASVSGGLSIESVSSSSAVLKVDYSVTTEDCSVESVTVELLNG
HVIDTKTLNSPQDSVEFTVTQEGDYTARIIVQCTSGVITEAMTNTVTVRFPSASVSGK
LSIKNLGASSAVLEVSYIATENCNVNSVTIELLRDDQVVTTKTVNSPQGSIEFTVTE
20 EGKYKAKIARCTNGVTIETLTNAVWVQFPSTQTPAGIRFDLSILSPLAAIAGIMLAWQL
LGQPVQTTSETVEAPTIPNKQVTAKEVQKEGVEQERKTTNVPETEKIKEGKELGKPL
SELRSREEVEKVRGAVEVGESVRSSENGSSRRRGGTTGVLVIGKYVTGIPGVLALLA
GVCVVGAALIFRCRR

<SEQ ID No.:0974;PRT;Methanopyrus kandleri>

LHYVLECEGSEGFDDDSLVRCECGGLLEVALRYDEIEVSRSTFEGRRLGWWAFR
ELLPVNTDDPVTMSEGGTGLHPCPRLGEELGVRELFVKNEGENPTGSFKDRGMTV
GVTKAVELGAEVVACASTGNTSASLAAYAARAGLTCAVLLPAGKVALGKLAQALFH
GARVIPVNGNFDALDVVKLADEGIVYILNSVNPFRLSGQRTIAYEICLQLDWEVPD
30 AVVVPVGNAGNISAIWQGFLDLYRLGIIDELPRMYGVQAEGARPIVEAIRRGKEDIEP
DPEPETVATAIRIGNPVNAIKALRAIRCSGGWAVEVSDEEILSAQRELATREGIFVEP
ASAASIAGLRKFVEEGEIDADERVVCVTTGHGLKDPETVMEVCELPEPVEPDPETIQ
RLIAE

<SEQ ID No.:0975;PRT;Methanopyrus kandleri>

LVVPTTEEEPSKDLPPERVFAYGTLTDPEMVVGVLNRLPTIYPVLEGYELALEVDG
GRYNTIREREGSEVKGALLVGLSDEDIRADRYEGYPVLYERERERVEKTSLSGSYEAY
VYIARE

<SEQ ID No.:0976;PRT;Methanopyrus kandleri>

VLRRIPRPYTRTRPLLPPSGPSPVGTFFDDHLFPRTRTLPHGSPGGTRPLARLMRLSF
RLPSLRDCVLGWILLGISALYSPHLTVYVTLPALASFVILLDLAKRDVPPNRWPF
VGLVYAVPLVLSVPLGTAVAVTKGVMSTFLTALLGTVRSGVLRAPVLAAYLVIDSL
ALATLTGVPLPPLLLASLTGGVVGAAVAVVDTLTLASLGIRTTDAFGEFLSFKSGRD
45 HSLHSLFRGMETRTRVRVPVRVFAFMTKNGDVKGCFVIPWIHPGPLGDVGGGDLP
GRIVRRLKEGIVPLVFHSTTTTHDFNPVDRREAGKIVEETVRLVREAADREGCSVGS
APVRGEETDSVGQILGDRLFLVLSKYPEPSDDIDAATGIALERETGGWVADCHNCF
GDPDRGRVYAFSEDFWRLMRDARRISERVEPTPGLRAGFDHADPGDPETGLGS
GGVSVAAVEADGTRTLYVVFDSNSIVRELKEEVERTLRDLAEEVVVCTSDSHEVNP
50 RGYNPLGQIMGRNDKRRLKAVRCAAEGAIEDLEECEVVPVEGWVKVEVTGPGSF
QRLVHSVETTRTVIGVLLPTAFLGVALLSLLFGIRT

- <SEQ ID No.:0977;PRT;Methanopyrus kandleri>
 VGLGRELRRIGLEPVFSSFGEGREMLMREFPDAPVYGLPKIELFSEDGSFDLLLLLR
 RHPDLPLRFYAGVEADRRVIRRHGCKVVVSDCQFHALVAAQIIGVPAIVISNMLRVP
 GEGSLVRLINGMLRRMFELADIVLIPDTYDDTYDVPEIDTEVWVGPILKRRPDELPP
 5 RDAVRRKYGIPDDATVVLVTAGGSKYGRIRVRIAVEGLKLLSKSIDVFPVIIEERVGD
 GLGLQLRYVDNLELIKVSNVITHGGHTTLSECACLRTPVVSVPPLPNHPEQHMNAE
 RVLQRGLGVAVPPEELSPKRIAEAEQAIDWKVPKIRMMMDGRGAERAAARIVAGTLD
- <SEQ ID No.:0978;PRT;Methanopyrus kandleri>
 10 LTSKELGRQLIHATFGLLFLPLHMLGVYEFALLLSGLIAGVSVSFALRRGLHVPIAK
 ELVDAFERPDEMHIPIGQGTLLHFVTGLLLATIICPYTKVLDVTIIVLSVGDSASTIAGKAI
 GRIPIPYSSRKTVEGSLVGFTAAALASLAWTGDVWVSALAAGVGMLVESLPTPNNDV
 TIPVAVSVALGFWWGLL
- <SEQ ID No.:0979;PRT;Methanopyrus kandleri>
 15 LRWNLTVGVTALALILLVTALAPSYIPAACLLEGGSRPKLVAFGLLTAFLSGSAVVR
 KRPDPLITSLLLLVL PFTSNLLHCVAAKSIGVPPGSEFFVFNGRVLEGDSPLHTHIGK
 AALTWALERVCRISLYIHCGMSLVETYPYVLAAEFVVVSLSVLLGVFNTRDPLSCLA
 SSSLVLSSIDGGAFSLPYVHGSWLLALRYVREPELMIILLWFAALSPYCKLVLGTLT
 20 HAYYGERWDSVRLQVLGAPLDGPLKSLGGVRCDGYYVLPVRSCAEWKEFLRNLE
 DSLRRSKVRWVAFCTFPNMAMYL
- <SEQ ID No.:0980;PRT;Methanopyrus kandleri>
 25 LTAITVLEKPGIRVKARVKQGRVSFEMEGKLASLLRPLKRLFEHLEEEKPAAVREDRI
 VFSLYLPPFPSPRAFTRLLRARLKSEVLGRRVPEAVTMAVTQRCPCNCVHCSADRRR
 PTELSTEDWHRAIREALDLGTYNVFTTGGDPLFREDLPELIQAVDDDRAIATAFTSG
 YTLKDRVKEKELKEAGLYAIHVSIDSPDPEEHDELRGVPGLFERCISGIKAALDAGLLVG
 VSTYATPETVETGKVEDVRLAADLGAHEVTIFDAVPTGRLLHEESVILSDEHREDLI
 30 DLHLRWNREKSSGPRVSAMSYVNSEHGAGCFAGYVQCHVTNDGEVTPCDFTPISF
 GNIREDLKAAWKRMSTSHPEWGKWRPHCRMQDPEVRRRYIRKIPPDATLPVRIDE
 LEGDGS
- <SEQ ID No.:0981;PRT;Methanopyrus kandleri>
 35 MLLRVPYLPQVHSHRGIPLEAETVAIALTIILAAMALGRAAGMKFRYGILYRATRSVG
 FMDRWLEHTLLGPVLKVSVRASPILGFAGLAFAYTLVKGASEGSGGFTVLLPGITLP
 LISGLASLAVILTVELGHAVAARLSGIRIKRIGFFLVVLPGAFVELEEEEFRRAPLRR
 RIEVLSAGPAFNVLTSFIAMGAVLGLSAIPGYVTSVGMVHGMFKDVPLHTGEVIRE
 VDGQPVKTIVDLRRALANHKPGDVVQVATDSGTKLVKVHEHRGRPVLGYYVIPNFG
 40 GYLVSVMVALVMFLNMLGMLSLGIGVANLLPIKPLDGGRIVHEVLREVLDPSLASR
 LSTTVSIVALILLVLNLRAPYHVLGT
- <SEQ ID No.:0982;PRT;Methanopyrus kandleri>
 45 VDLREVVRYTEEHWELLRTLDRARKVETLSQFGLEGWVHGVSARGDVVRPGSDV
 DVFIPTPVSPHVDAFMDAAPFEVVGVTAVLPTPRDCVRIKVAMEEDVEVTFPITPP
 TDRELEFFDFSGKLT PDSLERDERVPGVDKRLRMIEPKPWGHVEYSILGREGEVAT
 KLGVSTQLIHERVRALTRRDKVGVQGVHAKVEGRPGEPVIELLRELGRNPKAAEK
 LSELGV
- <SEQ ID No.:0983;PRT;Methanopyrus kandleri>
 50 LTKPVEPDDPRIRLLLAYVNRVKDRAASGGYSGVNRRLTEVLQSIESTLQELRYSY
 LPPENVSERLKDLLPDLEDVVDPEEPELRWLVEYLEHADEVFEREIGDEADAVLCVV

GEVGSVREHPNADNLYITVVNTGRFGKRTVVNTLDVEEGDSMAVALLPPREFSGV
VSEGMFCGEADGEPGEIIEPPERGEVRSIVLEWIEGV

5 <SEQ ID No.:0984;PRT;Methanopyrus kandleri>
MVSADDLTYREKL VLLALYEEFDGGPAGVKKLAPVVHMDKTKVSRALNALEEKGLV
EFEHMEGRRLTDEGEKIAEEIAEEMELPEDEGPYQCSDCGRKYKHLRLKCAVCGG
EIEVNKDHPDAAKAEWNLERARMGYL

10 <SEQ ID No.:0985;PRT;Methanopyrus kandleri>
VLTRILQVIGVGPEEITVYDKKWEQYRPLVYYANSVLAREEGNLSWESDRCSRTTR
VT

15 <SEQ ID No.:0986;PRT;Methanopyrus kandleri>
LTKEHWSEVKAREVTEHCRKHADEL PDEIVVASGASTSGRLHVG NARDVLTADAVA
RVL RERYHEDVRV VVWISDDVDPLRRIPRDL DGR LSEDYLGVPYKAIPVGDEPYSDR
WARNFVEELREFGAEVEWISSAELYTDNGFVKLVREV VNDYYGGGRLASVLERF
GLEDARVYMPVCEE CGRIATTRVVDVDGWRIEYVCEGRHEIGDAVLEGCGHRGEL
DLRKPIEVNGFEIPPGKLGWKIEWPTRWVYLGVACEPFGKDHYVAGGSYEVGSAIA
EEFFGFAPVPVPYEWITLDGKAMSSSKGHYVTLSDWGEVCHREVLRYLVLRGKPL
20 KHLDLDRFGLLQAVDDYDELEKRYFAGEADERERRIYELSRVDEIPEECPPHPVFR
FCAVVAQVVGIEDDVSEEEFERALEIFRRTGHLEAEPEGFGREWL RERLEKASRVV
DRYAPEEARFRVREEPEPVELSDKEREFLDLVRRLESETTKEDPETLQRTVFEAA
RTAGLRPADAFRVFYNVVVGKDRGPRAGTLIAAVGVDRISRLIRGCLEASD

25 <SEQ ID No.:0987;PRT;Methanopyrus kandleri>
VVRGAFFPKGRCRLCVC GAKLVVFTGVCNRCWCYCPVSPRKKGS DVSFANERPIRS
ERDLVKEAELMDAEGASLTGGDPLTRLERAVNIIRTLKDEFGDDFHIHLYAPAESVR
EGAIEELDGVGLDEL RVHPSPDSTVNRRAAEVLED SGMDLGFEMPAIPGEENWILE
VAKLADEYGFDFLNVNELEFTESNAEELRRRRFERVDDDLSDAVAGSERTALTALS
30 EVANDVGITLHYCPSEVKDAVQFRKRIKRM AKNVARDHEEIDE EGLIVKGIFEVISGD
PEDLADVLINILEVPEEWVYVDGSRVETKPFVVD ELADVLSDLEEASRCEIRAWIIRE
YPTWDRTVVERWPVRG

35 <SEQ ID No.:0988;PRT;Methanopyrus kandleri>
MAGAGVSASREDIALRLRRVSRVWGAALYVGSVLLIVLIAVLGLGALGQYSYQAQVL
LFGNYRGQLAEIDEKYQVLKTEFDQANHKLQALRDLYPISSADLHQVEKIRAKASLEL
QSLKLKKKDTEFAVYVLKDPATSD LKLKECMAELRRAEAAVKAFVRAVKGLEDKYA
GRVH

40 <SEQ ID No.:0989;PRT;Methanopyrus kandleri>
LKVERHSGYLRFRLYGLIEFEVDPEEFRRMVTAVISKRERRTPVPTLQGTRVAAPVP
REVL VGVLTDLISRLAGESGKNAYTGRRVYYITETTGIPLIGHTAFGLIDRGTNVIQVR
PLSGCNLCCICYCSVDEGPISRTRSRDFMVDPDYLM EWFD RVAEFKGGLEAHL DG
QGEPTLYPFLPDVVQALKEHPHVDIVSIQTNAVPLSEDLVDELVEAGIDRFNVSVNSL
45 DPKKARAMAGRKDYDVEHV KRVVEYIAQET EADV LVAPLWLPGYND DDIVEIIGWA
AKIGAGKRW PPLGIQNYLEYRFGRRPKFLRRVIMKEFYRWLRELES RTEVRPLVLK
PEHFGTEPRKSLPKPFRRGDVIRAEIVLEGR LRGEMIARAADR VIAIPDSAKILNVGD
RVRVKVTRDKHNIFVGILV

50 <SEQ ID No.:0990;PRT;Methanopyrus kandleri>

MAEERSKDDIPDWWEKEWVEFRYRGYTLGELMKMPIEEFIELLPARQRRSLKRGLP
SRHKLLRKVRRARLLRRGKKPPVIRTHCRDMILPEMVGLTIAVYNGKEFKEVKIE
PEMIGHYLGEFAKTRKTVEHGGIGATRSSLFVPLK

5 <SEQ ID No.:0991;PRT;Methanopyrus kandleri>
MELARECAPELKSGRVKEIYKTLKEMAERVPLKEYSEARCSLMVWVRAEEELPTNS
IAQYVTS TRYTFEVTVRQADSTS RPRIVEVILERHEARSRGPLDELKVHGSASVDE
PVERRGRSLIGALKIALRYLREYDVEREWKWKVTNKFREMVQKVTSLGSDEPGIL
VMEDSKVGTEYDGLFEYWVALKSGSIALSAVRRVLEVDRKLSLYGVHVEVPDARW

10 <SEQ ID No.:0992;PRT;Methanopyrus kandleri>
MIDVLLINPPDVTTKYQRFLGITAPPLGLAYIAAVLEEAGYTVKILDCPPLDMSFEDLR
RAVRKLRPRIVSIMATTPIIHQAYQAAKVKEELEDVIVCLGGYHPTFMDVECLKECP
YVDVVRREGEFTLLDLAKVFDGVKTLSEVLGITYREKDDIVRAPDRPLIRDLDALPF
15 PARHLLPMDKYTFFGAKTTATTMVSSRGCPVGCDFCASSAMHGHKLRMHSAERVV
SEMAHVHENYGSIIAFVDDTFTYDRRRVEEICRLIVESGLDVTWGCAARVDTIDRE
LLELMREAGCSVLFFGVESGSQEVLDNVGKGFTVEQTKKAFQLCREFDIVTVASAVI
GLPGETHR SARQTIKFLKEIDPDYAVVSVATPYPGTFKYQEAVEKGLIEEKSWDKYT
LMDPVVRTTELSPEEVKKYQKRAMIEFYLRPRYLIRRLKEDGIDAVRVTGTMI AEVAF
20 KKM KALLAKIPSPRF SHRKG SDE

<SEQ ID No.:0993;PRT;Methanopyrus kandleri>
LRISVKAPLKAILAGEHAVVYGYP AVAVALD TYVRVTAEPGDD SFRVETELSCEGNV
RAEITRDGNVKGFRSESLHEELTYVATAVRKASEEFDAPPSNLRLSEAPPASGLGT
25 SAAVTA AVLLGLAEVSGVNV SREEIRRLVREVELEVQ GKASWTDATVVTYGGFVRV
SGREFELIEPERNPVLVVAHSQEPSRTGEMVRRVAELRERL DIVDGMELIGELVDD
LEAALRDGDLRTV GELMNANHGLLAALNVSTRAL EIVHVFRSAGALGAKVTGAGG
GGCAVALFEREEDAKRAVETLSALGYEAFVTRPSPCGVKTEDSGS

30 <SEQ ID No.:0994;PRT;Methanopyrus kandleri>
LMLPKTLKPVEDKYVESLEELADLIASADLRTGVVRITARSGDALLDAFIVVLNGKV
VYIEVEEVRTGERWRGEEALEHLREILSAIEGGQSAVVDVFEASEDDIEMIFEYHGIR
PKEIELEDVLPVPALEADIEFETEELEGAEKEEATEETGIGVEEIEEAYDEEPEAVESY
DFTEEVEREPESLSREEILKKYGIKEPDES FVENILKEFTGVETDLRERISRVLR SYGI
35 TVFKVEGIVEVLLGNDTDEEEV VETIRDFMKDAGVDELEV RTYRPEWLGRKI

<SEQ ID No.:0995;PRT;Methanopyrus kandleri>
MSVDELFPFDSVAVIGLGVEGRTCAARLAELGLKVYASDIREDVDVSSLERLPNVEVE
LGHHIDIRIREDTVYFSPSIPND AEIVREVRNIGVPPLEDLLTWP DSSKFVVVSGTN
40 GKTTTVH MIDHLLDKLGIDRKIGGNAGGGFDGYATLYVRAELARPEVVCEVCDMT
LDYFSDRAPRYDVAVFLNLGLDHL DYHGSIERYAARAARFCDRARETAIVKCDGEE
RKVVERMESTPRCYDELDVEVDIPLRGEFYRLDAKAALLAVAEITSEPPEELAPLLSD
FTSVPGRIKEYKLGEGR LVIGKTDNLSALKV VLRDYGPLDVVFWGT PRPGEDYRIEG
IGRTLREAGVERVYVFPGLSEETVDDVIEELTSSGIEAS PVEPSEVASKALELARRGR
45 DVGVLGN GQDVII SIQH DVERAVRFLTAGSERSRG

<SEQ ID No.:0996;PRT;Methanopyrus kandleri>
MEVEFIRLADEIPECEFLIEGYPGIGMVGVIARHV VTECGAEP AFVMKIEDMPTAAIV
HEGRVYPSAGVFVLDL SFFYAEQADMRPGV VQNISESVAELSREIGVECIVCLAGI
50 RAPDLEDEPSLYYAATSDKAAELFEGIAEPLKGGTITGVSGPL LLEGSLRGLDAVCLL
VETPGTYPD PKAASRVVEALNEALGLSVDVSKLEEEAERIAKAVEETVQRLREQQR
MEEEEAEP TERM FV

- 5 <SEQ ID No.:0997;PRT;Methanopyrus kandleri>
LKMLAITGVSFRVVEQLLTQGSTQIIVRSGNNLDAVRLQPGDLVFVTTVGKRELKK
GVSGVATVRSVSVVHEHVVTGGDEHFEREFVAARLILNRVSGSRVREYKDCGVG
RRVEVDVEMESAVSEAY
- 10 <SEQ ID No.:0998;PRT;Methanopyrus kandleri>
LVAYQQGGGLVAFKLFVYPPLTAVPPVLPQIKPGEDELSVVRTLALFVSDTMQYDVGA
EPPEYVPPVLRRAFAELELRGRWRGACGTASYMFSYLCRLYGIPTRLVLIPTDTGT
VWSGTGRERERFVLHAQVQVWVHGRWMTVDPSVGLVGTSDRPVQGHRVRPDGT
ELYTPGVKSYTVCTQGPLVFWDTLTGLVELIV
- 15 <SEQ ID No.:0999;PRT;Methanopyrus kandleri>
VYYSSLAFAFERLERISSRKAKISLIAQFLRQCPEDVVDTVLFLANQVFPGWDPDRD
LGIGSKLMRKVIATATGSTDSEVTELFKRLGDLGLTAEELLKRKTSTLLDSRPLMVG
EVRETFEKIAEVEGEGAVKRKMLMMGLLARAKPKEARYLVRQALSELRTGVREST
VEEAIAQAFGVSRKLVERAHMLSNDLGLVAKVAMTKGEEGLREIDLRPMRPIKPMLA
QAARNVKEALAEVGGKGAVEIKLDGARVQVHSDGEEVRVYTRIEDVTHALPDIVE
20 AVKDCVDADEFIAGEAVAINPETGKPRPFQELLHRIKRYDIEEVRKEIPVELHLFDC
LYVDGESLVDTPFRERRRRLEEIVREREGEVMLVEQVITDDPKEAAEMFHRAEMG
HEGVMVKDL DANYTPGVRGKKMLKVVPVLETLDCCVIGGIWKGKGRKGLIGSYLLA
VWDENKENLLEVGKVGTMDDETLERLT KMFEDLIVEESGREVRFKPEVFEVEFE
DIQKSPKYSSGFALRFPRLVRVDDLGPEADTIEKVRRIYEEVLQKH
- 25 <SEQ ID No.:1000;PRT;Methanopyrus kandleri>
MVMVERVVQALPEMEPEDFKVLRALELEMRRHDWVPFDRLLERTGLDEKELGYRL
SRLDRWDMVVRTRRQT VGYLGYQLRPEGYDALALRALVDQGVLEGLGPEIGVGKE
ADVYLGISPKGAQLAVKFNRIGRTSYTKIKRYREYVKDKRHSWLYVNRLTAEREFE
ALLHLYPEGVSVPRPVAQNRHVLVMERFEGRELAETRVENPEAVLNRVLEEYEHAL
30 EVGVVHGDLSQFNIVEGDDVLLIDWAHWVEVSHPSARELVERDVRNVCDYFRRK
YGVHRHPREFFENS
- 35 <SEQ ID No.:1001;PRT;Methanopyrus kandleri>
MPIEIDMDSCLLCEACVAACPTGAIRREDGDMNHCIVCGACVKACPVDALAELEDLER
EVDGEKVELKRIAWKPEECHKEDPPQCCEVCPQEIMRIEDGYPELRFVCMCLKC
METCPIDAIGMKGVVEPKSEPPEHPEDEDVYVHPERCVGCTYCLQVCPTDAIEMVP
TDAEFFKAEENEWSVYVDPDTMELKQGRKVAKIDPEKCTGCTLCAQVCPWGAT
AARDVPVQSREVKNEIDEDKCVGCGVCAEVC PGDLIEVDGVAKVPEKCPACKLCE
40 RACPVDASINVS YERSGEME
- 45 <SEQ ID No.:1002;PRT;Methanopyrus kandleri>
LRVGTYLVDGTPRAVFLDDEVHVDLPVLEFIEVVHSDGLGLDLDYSVYPLSELRIG
PPVPRPPKIICFGLNYREHVEELREMGMDVPSEPVMTMKAPTAVIGHLDTVKLPREA
RRVDHELELAVVIGERC RKVSPEEARDV LGFTIINDVTARDIEKREGQWVRKSYD
45 TFAPLGPWIETELEPDGLEMELRVNGEVRQRATTDDMVRDPYELVSFTSRVMTLEP
GDIIATGTPPGVGPMEPDDKIELEIERIGRLVHYVGQ
- 50 <SEQ ID No.:1003;PRT;Methanopyrus kandleri>
MDWVALDDTDSPAGGCTTHAAVLLRAELAEAGAEPVGRPLLVRNPNVPFKTRGN
AAVALPVEAPWSVDIEAVLRLAKKVRKGYPETRPGLVCEGEPPRVCSVYEEA
VRRILNPGRVKESVDDDVNVVLEGRGIVGAVAALGFARVRKDHEVT FEGIA YRAEK
YWGTERREVEESSIREFDRTFPVTFDNLDSRDGDLITPNTPCPVLYGVRVSEPDV

LEVAPDMIKTREPVVEYEIFESNQATDAHLVRVDRLADAEDYSNPVLDLTVVEEPRR
IPGGHVVRCEDEEGVRVDIAAFRPARPLTEVVAALHPGDEIRVAGALRPETPKHPR
TVNVEKLRVLRLEERVEVRNPVCGRCRRSMKSAGRKKGFKCSCGERAPEDSKIGV
EVPRELVEGVTYEAPPVARRHLSKPEYLVLEGLLEPSPLSR

5

<SEQ ID No.:1004;PRT;Methanopyrus kandleri>
VVVGQKILASAVAHLPLFLVGAVGIYFILTASMKDDEHLRRLGFLIIVIGGPTSVLVSAI
VGG

10

<SEQ ID No.:1005;PRT;Methanopyrus kandleri>
VRAELCADLEEALRAGGHEVVRIERACFDIFVTRDGRAYIVKVLINADGLRREVAE
ELRRISHFLEAVPVVVALKRHTGPLEKGVVYHRYEVPVLDPLTFARLVEGEPPKAVA
DRGGQYVIRADEVDELDSRVRRRQLRREGGRITLARAEEADVEGVVELKTPEH
VDTGRDRMTRFERRVAELLERMGAERTGKVRRAFPKLLAKDGETVLARAEEGGDR
ESIALRDVASATGSMGVITRERCKDTYVPTIDIGTLEEIKDLEDLKEYLQERDPEER
VRRLVEEAGITSPREIAQRTGIRESVIREFLRRMGITDERKV

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<SEQ ID No.:1006;PRT;Methanopyrus kandleri>
MAMLAGDGRQVLILPEGYQRFVGRDAQRMNIMAARVVAETVRTTLGPMGMDKML
VDEMGDVVTNDGVTILEEMDIEHPAAKMVVEVAKTQEDEVGDGTTTAVVLAGELL
HKAEDLLQQDIHPTVIARGYRMAVEKAEIEEIAEEIDPDDEETLKKIAKTAMTGKGV
EKARDYLAELVVKAVKQVAEEEDGEIVIDTDHIKLEKKEGGGLEDTELVKGMVIDKE
RVHPGMPRRVENAKIALLCNPIEVKETETDAEIRITDPEQLQAFIEEEERMLSEMVDK
IAETGANVVFCQKGIDDLAQHYLAKKILAVRRVKKSDMQKLARATGARIVTNIDDL
EEDLGEAEVVEEKKVAGDKMIFVEGCKDPKAVTILIRGGTEHVVDDEAERAIEDAIGV
AALEDGKVVAGGGGAPEVEVARQLRDFADGVEGREQLAVEAFADALEIIPRTLAEN
SGLDPIDVLVQLRAKHEDGQVTAGIDVYDGDVKDMLLEEGVVEPLRVKTQALASATE
AAEMILRIDDVIAARELSKEEEEEEEEGGSSEF

25

30

<SEQ ID No.:1007;PRT;Methanopyrus kandleri>
VIALRVEDVLKAGVLITFVGIVLTALAILLAIKNASGRGEWGGVILIGPVPVVGSSPK
MALIVAVLALAMMLIMFLMWSAKGR

35

<SEQ ID No.:1008;PRT;Methanopyrus kandleri>
VGLFEKYVSNLNRLLILTMVFAVICAGSTLALGVKKGIDLKGGTMVILKTEKDPDVTVS
EASRILGVSDVEAIRSSQGDVIVQVPKYL SADDVNKLARAVGGEVESVQTIGPALGR
VFWESVKVAVPLALVAVSIVVFAIFRKPLLSAAVLGALALDLVDALGLMALTGVPLTL
ASFAGLLMIIGYAVDSNILLSMYTVKRRRVRRVDRAIADSFKTGITMVATTTAAACAL
FLLSMSEAMFEIAAVVIFGLIADVLNTWIFNAWVIREKIAGR

40

45

<SEQ ID No.:1009;PRT;Methanopyrus kandleri>
LSGLGWMKENWRLLVITAVWIVAATSLAVKGVNLGLELKGGTMVIAKTDHPVSKKE
MDQTVTVLESRLSTFGFKGIQIPVGRDHIIVMLPGTPPKEAVELITKPGRFEAKYKG
KTVITGQDIESVESPRIERVEGGYQWSVPFRLTAEGARKFAEVAKNAPGQPIDMYLD
NKKVSSPRISEDLAMAAASGHMEREIEIVGGAKTKEQAEREAKEIMAVLRSGQLPAK
LVPEGVYSVSATLGQNFLKMAMIAGAIFAAVSVIIALRYRDIRISGPILFTGSSEVVFL
IGLASLTGFTIDL PALAGIILSIGSGVDDLIVITDEIVRGERRKEEVTLRQRIKRAFSVVL
ASFATLAAAMAVL FVAGMGLLKGF AIMTIAGAFYGVVITRPVYADLLKKILGTE

50

<SEQ ID No.:1010;PRT;Methanopyrus kandleri>
VDVKLVSSILGTVVKVAAPVLLPLPISLLYGELDCIAPLLLTSLIMLVCGVALERIARV
ERHVRPRHAIVAVPIIWLVIPLFTSLPYRFCEHMSWLDAYFESMSGWTTTGLTVLPDI

- 5 DHAHRTILFWRSLQWVGGLGIVVSIISILRFETPSLLYVAEAREERIRPNVVNTAKE
MWKIYITITAVGFLALWAAGMNPFDALNHSMTAVATGGFSTRSESVTAWHSPTVELI
TVVLMVLGATSFVTHYRVAKTFRTPAELPKRIIKALRQYLQDRQFLTMIGLTAAVTA
YAGAVSGDRAWDVVRYGYQAVSAITCCGFSNADVLSFPEYAKLAITILMIVGGSTA
10 STAGAIKVLRLFLIMAEAVKAAIARRTQPIRGVVVPRIGSRVLSSEDEISDAFAIASAYMF
FLLIGTLLLTAYGYPLVDALFEVASAQGGVGLSSGITAPNAPAFVKILLIFHMWIGRLE
VLPCLAALYWLTLILKRLAVKGRD
- 10 <SEQ ID No.:1011;PRT;Methanopyrus kandleri>
MYVVVVGGGRVGRILAELLIAHGHDVVVIEKDKRRARELAQSELDVLVQQDATDL
DVLQDAEJETADVAAVTDKDEVNLAVSLIAKEEFGVERVVSRTDDRFDVFRRLG
VDAVVPDRSAAQLIEKAITRHNLVDVIMFGRGEAELEFEVTEDSLVSGKKISEIPA
DCVIVAIYRDDELELPRGDMEINPGDRVLVLALRDKLKKVEKLFKGRDEGE
- 15 <SEQ ID No.:1012;PRT;Methanopyrus kandleri>
VAIEPMREVFVCLDEKVSDDLKRVQLEGCLHVEDFWEAHGVEKFYGVKRPEVPQE
LMKLTDVLTRLARIEESLRRIHEEVRSTGLLDALKPMFKAERPETVEFELKPTTEEIVE
DANEFLEELESEAGEKLRNLKDELERLEEACSFLEYVEEDFNVSHLGEGRPVV
20 ARLYTVRADSWDDLQELDGEPAVVGKVGTEDEGDPIAVIAFPKSGSIESEIRRLGA
MEEEVVNEVLEDREGSVQSVREELAEIEEVKDELERTKHELAEFYEEERGTEIRAW
VELLENERELFDVLPKLAMTDRTYLIYGWVPEEEVGRFKEVVKEATDGLCEIVVHEP
SDLENMPVRLRNPRFIQPFETLVEMFSLPKPTEIDPTPIVAIFFPIYFGFILTDAAYGAI
LTALAAAIRMGAGRVDSEIRKFSEILLYAGIVTIILGALTGGYFGNLLGIKPLWVDPMK
25 DPITILIVALGFGVLHVIGLMLGMYVSLRKQRDMRSFMLDYLCWFLILLGGLLLAVA
YKTGGIYTPLGYAGIAIAGLGFVLVLGHKLLGVLDITIGFMDILSYSRLLAGCLSTAG
IALVVNLLAKMVEGLGVVGYVIAGIILIGGHLFNMAMNGLGAFVHSLRLHYVEFFSKF
YEGGGKPFEPLELKGEHVEIRA
- 30 <SEQ ID No.:1013;PRT;Methanopyrus kandleri>
MVSTELTIAAIGAGLAAGVAGVSGIGQGIAAAAAGAGAVAEDATFGKAIVFSVLPET
QAIYGLLTAILIMVGIGLLGAAKAVTVGAALAALGAGLAVGLAGISGIGQGIAAASGIGA
VLKDEALFGRAIVYAVLPETQAIYGLLVIAIIIMVGSGLLGAGGKVS LGAGLAAMGAG
LAVGLAGTSGIGQGIAAASGIHGVLRKEELFGR LIVFSVLPETQAIYGLLTAILIANFVG
35 LLGGPTSVSVGAGLAAMGAGLAVGLAGTSGIGQGIAAASGIKSLIEEEGVFGRAIVFS
VLPETQAIYGLLVAILTLFSLKPDLSLAAGLAALGMGLAVGIAGTSGIGQGIAAASGIA
GVLRKEELFGR LIVFSVLPETQAIYGLLTAILAMFFLGAGKPTLAAGLAAVGAGLAVG
FGGTSGIGQGIAAASGIRAMIERAELFVRGMVLSVLPETRAIYGLLIAILALFMMKSGS
VGAGLALIGAGLAVGLVGVSGIGQGFTAATGAATLVKNEGFFGRAIIFSVLPETQAIY
40 GLLTAILIMMFAGILGGAGANIGLGAGLAAGVAGLAVGLAGSSAIGQGIAAAGVGAS
AEKEELFGRSVVFSILPETQSIYGLLIGILLAVFAMKAGSPVGAGLAALGAGLAVGIAG
FSGIGQGIAAAGIGALKRDPGSFGRSLIFSILPETRSIYGLLVAILVMVGLGLMGGTF
SGNEAVGLAALGAGLAIGLAGLSGVGGQVTAATGISNVVKDPGMFGRSLLFSVPE
TQAIYGLLIAILIMMFAGILGGSKSPALGVGLAALGAGIAGVMAGTSGIGQGISAAGA
45 RATAEDPGNFGRSIVFSILPETQSIYGLLAGILALTPVLTGAGAHAAAAGLIGIGAGL
AVGVAGTSGIGQGIAAAGGTGALAERTEMFARSLILSILPETRSIYGLLIAILSMSLTG
VLGGAGKASLAVGFAAVAAGIAGVGFAGLSGIGQGITAARGASASMVRREQVFGKSLV
FSVLPETQAIYGLLTAILIVFAALAAS
- 50 <SEQ ID No.:1014;PRT;Methanopyrus kandleri>
MGVEELERKILEDAAEKEAEEILEAKRDAERIREKAEREAEEVRREILDRARREAETR
RRREIAQAKLEIRQERLRVKEEYIEKAIERAEKIRELAEEGRKEYLEFLKRSIAEAVN

AISSDEVVLRANENDLMLLDEMLSEIRDETGKDVELGEPVEAVGGVIAESKDGSEAY
DNTVDARLRRRRSEIVRRVSETLFGG

5 <SEQ ID No.:1015;PRT;Methanopyrus kandleri>
LLGLAGLQDYTLAVGIIALVTLSIILSIPITDVVWRYAPYAYPLPRAKAVEAETLSDE
DYEELKDAPVRDLVTRLEELGVEPEAARAVLDGNTAPLEIELKRRAVESVMERIVET
SPEDVSELARALIAKYELEDIKAVLRARHAGEEPKHLVDAPVLLGAETWRELKEARS
VPEVVDYLRGTPYDRGLEEALREYEETGSLLPLELALDRAYYHLWDLVVSEKVE
10 ELARLVGLEIDLNVNVEVALRGAILNLDPERVLEAMAEGGWELAEWRKRELAEAEDPL
EVVERLSGTSLGPYLEEAAEEYSEGRGVQVFDEALRKARYELAREIAGSDLIGAPAV
VHAVYEKQREVDNVISLVNAKVADVETMLV

15 <SEQ ID No.:1016;PRT;Methanopyrus kandleri>
VYVVAADVNGSVASGFRLVGVRTIDADREDPKEAVKKLASDPEVGVILTEDVAEKV
KEEVVEIQREKVSARGEATPIFVTVPGPEGPTTEEFEEIEIVKKAVGVEIDLERIER

20 <SEQ ID No.:1017;PRT;Methanopyrus kandleri>
VNSNVKGEIVKLAGPVVEAVGCEGAKMYEVFRVGDEGLIGEVINIESDRATIQVYEET
TGLQPGEPVKGTGELLSVELGPGLLTQIFDGIQRPLPEIRKEVGDFVERGILVSALDR
KKKWEFTPKVKEGEKVEEGDVLGTVPETEFIEHKIMVPPGVSGEVIEIAADGEYTV
DTIAVIEDEEGEEHEVTMMQEWVPRKPRPYKRKLDPEEPLITGQRVIDTFFPVAKGG
TAAIPGPFSGKTVTQQQLAKWADAQVWYIGCGGERGNEMTEVLEDFPELEDPR
GRPLMERTILVANTSNNPVAAREACIYTGITMAEYYRDMGYDVALMADSTSRWAEA
LREISGRLEEMPGEEGYPAYLASRLAEFYERAGRVVCLGSDDRVGSVTVVGAVSPP
25 GGDFSEPVTQNTLRIVKVFWDLSKLADRRHFPAINWLQSYSLYLDDEKWWHEEI
GGDWRELRLDEAMEILQRESELEEIVQLVGPDALPESERLILEVARMIREDFLQQNAF
HEVDTYCPPEKQYEMLKTIHFKERAEAEAVDKGVPVDEILKLDVIDDIARMKVIPNEE
AKEKIQEIRKKIDEQFEELIEEAS

30 <SEQ ID No.:1018;PRT;Methanopyrus kandleri>
VREFLVLFNHAPTSPDRVRLKDLPGSGRFDLVCRVTTQALLYSHGVRTDTVVHLL
RGPDDPKTITVTGRRVRRLYPDERTTAIHLRRALEADPDTEPHPGIFVRRADLEDL
LGEMKGAKLYLSEDGRDLEEVEPEPDAVFVLGDHEGPTPEQDRLLRRHADAVISL
GPIPYHADQCIVILHRYLDVKRPPEYAHGPSNVM

35 <SEQ ID No.:1019;PRT;Methanopyrus kandleri>
VAVVMEISFYPIGTGSPSVSDEIVEVVKALKEAGFEPQVGPMGTVVEVETFEDALEA
LRVAREAAALRVVDRAVFVVKIDERRDKELTAEGKVSVERKIQE

40 <SEQ ID No.:1020;PRT;Methanopyrus kandleri>
MLTVFLLALLISPVGCSGMKLGAVWISRESGYTHHLFLVDNASGALWYLGTDASPG
PRPWVLERTLRKPEPLIPGEVHPDALGAVVIPFKPGEWPGVALCSDPTTAATFRLL
DRPELRTILNGPVIVTTEVQGRPCCVRRTPDGFEFEDGTDADYNDVIEVTLEAV
VSVGELKISIKRESPEEYDVLLDRSTGSVIRITPDGEASPIIGTLDVHPERLGIALKG
45 EDTVLCSDAETAEVLRLKLAESPELRAFLDGAIIAWTTEVVGRRVDACRGSTKCEH
GVWYLRFGFEDGWDGVVDYDDVIVEITGPRGNFNPLSVLPLILMPRGRNPWRS

50 <SEQ ID No.:1021;PRT;Methanopyrus kandleri>
VTVLVSTLALGDWWADPERVNELPELTGSDGVLEILGSGFQPGRLDPNELNVEVSS
VHAPFADLNPASPSDHHHEYILEVIQRAAEALAEALDAHYLTVHPGHLTPVTIHDRELA
IELAIETLGELADEVRSFGVEPLVENMPDHSLLLGTSADEMEEILRASGCGFTLDVG

HALTAEGSLRPYLRLRPDLLHVHDNSGDGDEHLPPGSGILDFEELRRALHHRVLPV
VEVRGIEKAREAVRTVREIMERPEN

5 <SEQ ID No.:1022;PRT;Methanopyrus kandleri>
LEGKDKPVDVGDVYEVKIEDTGKRGDGVARVNGFVIFVPEAEKGDKVLVKIVSVRD
TYAIGRIVEI

10 <SEQ ID No.:1023;PRT;Methanopyrus kandleri>
VSSEIVLEHDVLTALREGGLKTPRFTVLERPEEASDVPFDPPTYTVKLLHSGVAHRAR
VGAIYTAVPSKERLERRVAELLERWPDVAVGVIVQEHLDVVKGIEAFLGIKEDDTFGTV
VLLGLGGKLVEELRAYIVRRPPVDGEDVERGLRRVPGGERLLSEIGNRLAEVVNA
AHGVYKEEGWSELVDNPLLLIDGEAIALDGLARKAD

15 <SEQ ID No.:1024;PRT;Methanopyrus kandleri>
VGPVSADWIPDSPDELFRKIHSGEVIELGQNTNRLGPPEEVRRAVVRAALEAPYNV
YAHPPQGDRLREGLLYFELDDDFDAVITNGAIEGVHAVIRAFASNGVAVTPDPGYK
TIDGMMMAEGVHVQEVDIYSEEDYQMTVDVMEEFDGNLRELDLIFVINPSNPLG
SSMSERELRGLVELAQDADAFLVHDCTYRDFAPEQPVACEMDPERCVDLYSFSKT
20 YGLAGLRIGAVIGERKLLQVSKYKVSCLGINLIAQEAAITALKVRDRWIPRLLREVTR
NQRLIKRECEGDGVKIPVYP SHANCLVIDFSEYGYIDSKTVVGKLYSEHGIFVRTGY
TSPRRGKGFIRVAFSAPREDIERFCEAFNEVMGELIKS

25 <SEQ ID No.:1025;PRT;Methanopyrus kandleri>
LCKYRKVLGVSRSLSGRARDILELVNNSGITVSEISRRLGLHRSTLDYVKILKDL
GLVETKPGRGGGVYPTKDAVLLVRSGGRVTIVRRGGGRARILIEAEDRPGLLADVT
NRLASAGVNILETELKVEEGIAIMEFEAENVVHEEVLQELDGLSGLIRVEVEPRGRK

30 <SEQ ID No.:1026;PRT;Methanopyrus kandleri>
LPLTPAEALLEILGTANVLVPRSYKPGKATGRAAVNRFALYAVRKGLGFEEVERPVR
VYTSWRGLSLAVPGEETTSYRATPRGRDVPPEELAEAVPDYPARPHFVVDYRFW
GEHSDFGRTNLIRQTAVTASTLRLYLSDRHMSLVNVTPEAEERFLNAFSPFEGGLYE
DWEDLIAELSVDRVILLDPNAEEELDENEIREDAVFVLGGIVDENMRGWTAKLAPGIP
CDVERRRITLRGSIIGVPDRINALVEALSRVIVEGESLERAILRVQSPRFARRRLSREL
35 RRLDRLTEELRLREVNLPKREILLEARRRGIELKVDLQDG

40 <SEQ ID No.:1027;PRT;Methanopyrus kandleri>
MAELGYEKAERCEVGEKPACKVGLRDGKRLIHDAHLRPEHYYSVYQSCCNWECL
FCHSWRFTQRPVGTWWSPEDFVRHALEYRETVTVWEPRSRATSFHATDLCLGCG
RCVTLGERPEWCPGELDPDQVVPSPQGWGPARNIVAFTGGDIACRPEFYVESIRG
LKSETDDLWVLEETNGFGLVRENVEELVAAGLDAWLDVKAWKEDVHRKLTGATN
RYTLKAIELLVEHDVLEVCTLYIPGYVEADQILRIAKYVADIDRNIPFTILAYFPEYKLS
VRPPKRSELETAERLAREVAGLKNVKIGNEGVALPG

45 <SEQ ID No.:1028;PRT;Methanopyrus kandleri>
MWGCSKGLSESEIRCPCICNGKYPAPALTVDGIVPYRGGIVLIRRGKKPFGKGLALP
GGFVECGETVEEAVAREVREETGLKVRPVELVGVYSDPGRDPRGHVSVCFRCEV
VGGELRAGSDAADVKVVDPSDLTPDDLAFDHYDMLRDAGIVR

50 <SEQ ID No.:1029;PRT;Methanopyrus kandleri>
LKRGKIAAYVAGGLLLCTVSANALLGMREPPRFAEIDNPSLGDRVFLAISGLVVGIM
GVSRGIWELRNVERVRAALGLLKKAEERYLEEGSERIPAKYNAVTYALRALRCVKNA

VEILEEMEEELSESQERELKEKAKEKEKAEKEGEEEEKVEKRGSSDVRTAERRDGAGD
ENSDDRRSRGDDGTADRGRRREEDRGVSDGGGSEGS

5 <SEQ ID No.:1030;PRT;Methanopyrus kandleri>
LVEFRAYQEEARYFKYAFNAAGKVVEEAPLIVTENGIVSRAMDASHIAMAVLEMPW
EMFDEYEPPSDELMYGLDMEEVTRIVRRARVTDEITLEGEDDEEEVIKLGSSGYERE
FRLRSIDIDDIPDEPELDFAVEVTVVPDFIQDAVRDADLVSDTVKVGAKGNTFYFKAE
GERGRVIPKVQEGAEALLTFEVEEDVETAYPLDYLKDMIQAAQGAESVRIRLGQDM
PLELTFRIGPAGEGKLTFFYLAPRVEE

10 <SEQ ID No.:1031;PRT;Methanopyrus kandleri>
MGWSALNVKRAWRKVRELRGWKAIFYVVLGVALGYGLRYGLGFVLGTPDPVVT
VISESMYPYNNVGDVLLVGVVPYRDIKVGDVIVYRLPGKPIPVHRVIAKTPEGVITK
GDNNPLPDPWCPIRPKEISGRVVLRIPIVGYPKALLDRYLYGG

15 <SEQ ID No.:1032;PRT;Methanopyrus kandleri>
VVEEDVVEITSRYLRRDPDKIAEIKYKAGIETLSDLAATDPATISDAFGVKESTAKKIID
AREEASKGIMEAKTLADLLEEEKKRDVIPTGIQGFDERMGGGLPTGVIVGMYGPPG
AGKSQFATQVAHALKEGESVLYIDTENAFRQRLLEIGGFKKDELKEVSDRFVLR
20 IIDAAALRQYFDEKEGEFISEAYELTPKVVIDSISQFPRPYSARDKLPERSRMIAHILN
TLLKYCTAYNALGMVTTHVQANPDAGKRWQDVAPTVLKHIAITYRFSIDYKGRTER
VITLEDAPDKPPFEVQVELTDRGLVG

25 <SEQ ID No.:1033;PRT;Methanopyrus kandleri>
VDRELVMRFLGTGGAVPSKDRSHPGLLVEFSGTCLLIDCGEGTQRRAMEQGVTHD
VDAVLLTHHHVDHVAGLLPLATTVDLLHGRRLKVYGPATGESALDISDLEVIEWREV
NPGDEVEIGDLRLVLYESEHGVPTVDYRIETPKIPGKADPKYIRRVPPSKRREVL
GERPYSLTGPKISVYVKGDRPADPENVRGCQVLVHEACFEDHEEAVRYLHSTH
LEAAEVAREAGVDLLVLTSLTKVDPERMREEAREVFPVVVWARDGLMVRVRR

30 <SEQ ID No.:1034;PRT;Methanopyrus kandleri>
VEAVVLFAPGRDVIVGGGNLFEASRRLYERALSDPSALGEASFPTLDIIRFVLYEE
GYDPREITLISLGTTRRLDHQYGHHPEDTEYCARLVSLYAEKEWGVRVEDPVLRKD
PDRFEVFREIEDVLKTLHRREDLKRSELYAYVGGAHNVGWAIRLIGATLWEDRFHP
35 LRVLDENVEVEPSPLILPMKTMKCVLIEHGLFEVAAGIAERFSAYEDRMEPVYLRAR
DSELNFNYYEARRLYAEVTRSAHLDELREARRRLRLKREAEKDPIRRIHHMRVVL
ENARYQWIRGEFGDFIVRLSMLYENYTQACFMLLYERLSGERVTTSDPVELASLLA
DLLGSSEELSGAVEDRLDSDIEAVLRELRGEEGEGRAVLAFHVAQKVLSGALEVG
AVEKDVFGPLSRYIQVLSCSELRKARHLFAHEGRGVSREDVERIVKAMARPCRVNF
40 ETIDELLSFLEEGIDRLELAVSEVRGTDGRG

<SEQ ID No.:1035;PRT;Methanopyrus kandleri>
VTEGFALPDDVQRVVYSRDEPTPPQRVAIPEIMDGKNVLVIAPTSSGKTETAVLP
VFSMVRELDEPGIKALYITPLRALNRDILRRIRWWGEKLGLEVAVRHGDTPQSERRR
45 QAEDPPDVLVTTPETLQAILPGKRMREHLSHVRHVIVDEVNELALDKRGVQLTLGLE
RLAEVAGDFQRIGLSAAVGSPDRVGKFLVGDRDVEVLEIEAERYLDVSVAHPTGPH
EVKERLELIHELAKERDSVLVFTNTRQMAELLATRLKTEYDDIEVEIHSSISREKRM
EVEKRFFKGEIDVLVCTSSLELGIDIGHVDLVVQYGSQRQVTRLVQRVGRAGRRRK
RAEGLVITSNPDDLAEAAVICRRALKGSLEPTEIPEGCLDVLHQLVGLCLDGHQVT
50 VDYALEVFRRAYPYRHLDATLREVAEFLDDIEVLRVRGDRVYRTKDAWKYYYSNL
SMIPDERHYRVVTESGGHVSVDLPFVLEYLRPGIKFICAGRPWIVQDQVDHRYEVL
VTPAEAVEGAIPSWVGEEIPVPEVAREVGEIGIGRAEAALEDGFTEAVEVAAETFG

GRREAKVLADLIRRQREHSAPVPLPERPVIEDLGGTLVIHVYGGTNPNTLEKVLGTLI
 SGRLGTTVRTYSTPYKIVISAEKRAGLDADLLMECLETLPSEDERGFHALTLRIVEKSE
 VFKRRLVHVLKRFGAIEPDADYRDVSPRRLLKAFKGTTPPYETVSEVERDLDTSVAF
 RLVKELEEKAEIVRVRDPSPFAEHVLEGLGEVGRVTSGLLAAQVETLKRDLERRKL
 5 WLGCPCGWRGRRSVKTVKEEGLECPDCGATYLVAAKTEEGLEKLLKDSERARR
 VADLLESYGAKALEALAVPGVGPEAAAKVLRSTGGREPHFYRELLQERLRYLRTRR
 FWD

<SEQ ID No.:1036;PRT;Methanopyrus kandleri>
 10 LPALVLIHIAVSIAHTPAHGRVGGFVSGHYLDPEFDAPNTSFGSDIDGDGRVDRIWC
 AEACAVDMYNLGVAMGWWNGDPVTPLQYEISATGEHDDNDIIDAFAQAIAGSDAA
 SKVFEVAVVSLNRPVSYPHVLVLGAVQEGSRRYFVVDDESTSDVGELLVLPYDLFL
 SNLHPGILEFFGPVEVNRLYSVLSGAISPLTVIVSSKRGRTLTVLLTDLPGDSLAAF
 TEELWKAALGYPVAVAVSKPFLDLGGVTRIRCDAPVTGDVETRRPLNGVESGEGP
 15 SPPLGIPIFIGTVGIAGLFFLLLTFLGLSYLPV

<SEQ ID No.:1037;PRT;Methanopyrus kandleri>
 20 VFNVDPSDLVTEGVPKPTKPMKATVLAVLRPRPGERILEIGAGSGSLTLELARAV
 GPLGRVYAVEGDKEAFRSLERNVRDFCLEDRIEIVRGWAPEALEDVDEDAVVSG
 SERLEEVLLALAERVRRRAILLNAVTPETFATAVKALDGWRRSCLCMVWGEGKVLRR
 GTLFSGMRTSYLALFEPER

<SEQ ID No.:1038;PRT;Methanopyrus kandleri>
 25 LNTGAPTLYGVGLGPGDPDLLTRKAIRIIKKVPVAMVPFVGAESRAARVVRAVDPEA
 TVVGYHAPMTRDPEERDRAYSKAAETLAELLERFHEVAVCNLGDPTLYATFWHIVE
 RIPLEDFEIELVPGIPAGLLCAARIGRPLAMESDKVLICTREPPEDLEGMDTVILYKPT
 RRGVERLLREGFEVYACRELGFEGERVERVNGAEFEPSTYCTIVALRP

<SEQ ID No.:1039;PRT;Methanopyrus kandleri>
 30 LLRTVWVDYARKGEPDVILVGRREDGNPAALVVKGFRPYFYAEVEDGFDPSEVERL
 SGVVEVEEVLLHPYGGDRVELLRIVATYPKVVPKLREQVKKLDGVKEVYEADIPFV
 RRAAVDLNLPPASEVDVSDLDTGWSGLPAYFADVEDARELDHRPYPIEDLVVASF
 DLEVLAEPGTTIKGASGPIIAISFAYSTPDGERRNYVITWKGEDESFEVDGVETEIV
 CRSEAAALRRFFDEFRRVDPDVFTYNGDEFDLPYLQHRAGKLGIDVSPLARPAGK
 35 RGIILKHGGGRYASDIFGRAHVDLYHTARKNLKLERFTLEEAVKDVLGVEKEEMELA
 DINEAWKRGNDLMRYSAEDAHYTLELGLLELAQVELELSYLTRLPLPDATRFSGGQ
 LAEWRAIYKARQEDILVPNKPTRDEYKRRRRKAYKGAIVFEPEIGLHENVVCVDFAS
 LYPNVMVAHNISPDTFDCDCCPRTVEEVDPTDATVAPDVGHKFKRRKGFFPRL
 VEGLIERRRELKRRRLKLDTESHPHEAKILDVRQQAYKVLANSYYGYMGWANARW
 40 FCRECAESVTAWGRYYISEVRRIAEEKYGLKVYVYGDTSFLVKLPDADLEETIERVK
 EFLKEVNGRLPVELELEDAYKRILFVTKKYYAGYTEDGKIVTKGLEVVRDWAIPAR
 ETQRRVLKRILADNDPEAALKEIHEVLERLKSQDVIDELAVTSQLTKKPSEYVQKGP
 HVRAALRLARHLGVEPEPGTIVRYVIVRGPGSVSDKAYPVELVREEGKEPDVDYYIE
 HQILPAVERIMRAIGYSRGQIVGETASQKTLQDQFFG
 45

<SEQ ID No.:1040;PRT;Methanopyrus kandleri>
 LRVAILDGYTDEPAGLGVPYLGTHPRYAYGAARAAGATEVRYVPVERVRSGDVL
 NRFDVVVGICGVHTPGKYLARPADLSEMLRILSEVDAVTVLGGPAAQSGHGRVG
 GELPETEVEGVDVIARGDVEAVVYDLVSEGSPEAVDPDRRSIEELREYSVKGAPA
 50 AREHVDYPDAVIAELETYRGCPFLSGGCSFCTEVPYRGEPEFRPPEDVVEEVKAL
 YKVGVRFRVGRQPCVFSYMAEGIGETERPRPNPEAVEKLFRICTVAPDLVTLHV
 DNANPAVIAEHPVESREIAKVLVRYGTPGNVVAFGVETFDERVARKNNLNVESKEE

VFRAIEVVASVGGYRGWNGMPYLLPGLNFVCGLIGENRERYRRDEEVLRELVERGL
RVRRINVRNVVFPFGTEMGEHGTKWLERNRERVAAFKRFRVREEVDPVLLRRVLPK
GTVLRRRLRVEPREPEFARQVGSYPVACRLLAEREPEGEWVDGLVVGHGARSVEVIP
LPVRREDGPDVLAKLPGVGKKEALDAFLKGRRPRVPYALRSWFAF

5

<SEQ ID No.:1041;PRT;Methanopyrus kandleri>

LPWTIIDALAEALASTKRVVVATSDPERALVIRGRPVKAKVAVAAHIWLCCLTAGDT
RALVTFLWLADPSFPTDAVEPPRTIVRTALSAYIPGTGWIGGIPHFDASFRDWLR
RLARGETEGTVVLFGRQKLPSWAVDVLRGMDLSAFASRLPNDLVVLAHGIDAVG
10 PRRDAVRLTEALDDVTSRYGVRTVAVFCESSFVKPVEVLSGLERQHKRVEALISVR
AFTLNFPKPAEYVIRLNTPIQVVPFTGDASMGLGEYATNRAGPSLEWTYQVQL
GSEREGSFYRVLWLNGKDDEPVLLPGTLDDLGRLLVDHILRLLLPDREKRVALV
YCYPPGRAELGAAYLDVPRSLARILARLAGEGFDLGPGEFFRELYRAYREDPREA
RTLEDVFVAVFNAMSSAVDPHDPRRSVLLANVGPWAKGELRRMFDLYEGGYGE
15 WSLNVDGREVEIEVRDGVTVSVDGRSFVLCISISRDQLIPAENVREWFEEVDVRL
HAYLDLVRELDPEAVRAAVEGMIEGFRRTWGDVTDNRGIMTDGRRYLVPALRFGN
VAVVLQPVRGWSGSPEAVYHSRELPPHWQYIAAYEWLRRVVFHADAVVYVGTHTGF
EFLPGHDRGLTVDWTHLLLPDVPQAYFYVSNPGEGLAKYRGGAVALTYPSPPSG
YFKDFRKYAELERLWSQYVSSSIYGGDPAVRKVIAEKILKKARELGILEDVKSIFAE
20 RGESPPEDPESWAERHLEEFDLALHDYLLALRDEKSFYGLHVIGEDLPVELAVEEAA
LLFAPRFAPYLAVTTGLTPKADLELFRRLADENPDFYQDVKIRTYELLRSMLEIWN
PYLRSVLLQWVELKDEGELRDDASLLSKADTILQRFKLNLLGLYRQSLKIGLWEVT
NQYDQDIKLI AEAFREFVHVYESGEYELDNLVNFLRGGHVPTGGFGEPLWNPKEY
PTGRNGVPFDPYTLPTPEAWEVAKRLMDDFLARYYRVYGRWPETVPIVLFASHELT
25 SGGGLGIAQVLYLLGVKPWWDPNVSGKVLGVELIPLDELKVKGNRWINRPRIDVVALC
TAVLDSIEPVVQLLAAAFRLASDAEEPLAYNHRRKHYLELLKLGVPPLAATGVFGE
PPGDIQGTGVNRLVELGWSELTKGLGIDGAGTVDAFSEKIAEIFESRVAYAFTVTG
NPNGSKLLREELTGEEAAVKAVKVFYRLASTVDAVIDQVNAFNVIDVNDYYSWIGG
MVTYVRLIRKKEPLVFLTVARDPHTAHVQTLAERLAIEVTELLSPSWWEALMAHGP
30 DVGWHEVMKRVQNIQVIAVTTTQVRPMVQTLTEVASTILSALERYRSTPKGWAE
VQSTLSWLVEAVRVGLWKPDRLTKALVRAWAEVTARYGPSTCHHTSLNPSTVPF
VRNLAASLGLNDVLKMLPDIVRAYRTLDPKVVVAEMIRMIVTRSRASYRAVEPRSVS
PRSLRAVEFVESPRANNLEVGNLPSGSVSRASELVSTTGVIHGRLPVGGAISTGGT
35 SGSGCRAVPLKSEAAKESEARAMVRESAPAPRVIWEWVVGLLAASMIVVLWARRQ
FRRWNW

<SEQ ID No.:1042;PRT;Methanopyrus kandleri>

LSTTLPNAEEVGRELGPVHVHRIPKDPTSIGNLDWDGISRDVRSADVLIQRMGT
VPTAFTRELSRRTLGTALDDN

40

<SEQ ID No.:1043;PRT;Methanopyrus kandleri>

VRFYFAVDKARERGVPIKEFKLIQEDGSVYWEGKFGRSKWETSSEVIYGNMVALSG
IYLGLLSGEVKPKTWPEPERSRFEKGITVGLARILSLQQEDGGWGWKVVLVEGKTR
FPAGKGHVLYTAKILAKVLIPALRLNIKNVSYGGTTYDVAEHARA A VRFLIDQQLESG
45 GYSANKEWSMTEDPLYTAWALRALCEAYRYRDLLGLDDATVQQVKEAIRRAVDWL
LSHQEDEGDYAGLWEMKSAAIMGSAYAPPSEAQIVRALIQAYSISEELGLNKAELKE
A

50

<SEQ ID No.:1044;PRT;Methanopyrus kandleri>

VDWALKYQDASLVEFDGRKVLGWAYSSTRLESCGPYLGYTALIAATLKLAEGLGLG
SKAVEKMRSVGTLEDEAEWVAHEWQEIDGLGYFLYPNSKAHKTVPSSQLYGL
TCAVAFSHPEVLLKRTTADVWKLVPKKGAWKVPVWPVTVVLLFACRRR

- <SEQ ID No.:1045;PRT;Methanopyrus kandleri>
VRFPALVIGLLVALGPTAASESPKVAVVMPYHGSYDPHWIYMAHELPEKVQEILSVT
YDEYNIQVYPGSFETYDVTKVRLQGGKEYVIHQEEVNTGEEVLKTELGHALKEAEF
5 TNSGRDGLIVVLPAFVNRGGQHQCVEIPEVIDIILGDKVPKYSVHYEPFGITNWDRO
NDIGIVPELLFRNIQTEAEKTLTGPNQGQDPEDVFSAYKDKRLLDFLVDHKDEVGLL
EIMFGTLRVGYWDDFKANAMYVLRGVAERLGNLLGTTIPVGEVDWALENPFVREG
KAYFFAFQNPEIGPENWEKSWEVRYEQFQKLMQSLCRQGVRYVAFPYITVTGIT
10 DRKLFEGNPEHGPEGDEPEAYDYPEAILRHFGAELVAETVADVRKYTYVQEGQEK
RTVYINARIYRIPKEKLGTDADMYVIYVRRGLLDAPNATEKVARVYANYIATHLPTWL
MEYEAVKGMKEGFEGEINSLRKDVKSLKKRKVAVYPAVIALALAMIPPLRRR
- <SEQ ID No.:1046;PRT;Methanopyrus kandleri>
MAVMDAEARSQGLPLAELLGGEPRTVESACSVHELKKGALREARDNLSVGYTVV
15 RVRADSAGLSSVSALDFETVLLLEFTDRPSERALEEVRVSDAEIVVISPEEFDAEVP
YVRVTSEEDIHGLGSAEGVALSVQEVGFLDAVLLGRKARELGFKIIVLTVESAVSVK
AAHLAGALRAEYCDLSGHLALYEDLES LGYAPEVELTGPGREVRVNHDPYELAEA
P
- <SEQ ID No.:1047;PRT;Methanopyrus kandleri>
20 LKRIVVVGAGSAGRSVARLLNHVGYDVVINDIRDWEDFTTEEREYLEVLEREGVEVA
LGGHDRELFE SADA AFVSPAIPEDAEGRKLAELVPEEITVEDVAGLLGDLFPVPAIGI
TG TNGKTTTTWAVAHLEACGYE VWRCSLDRHLVIEAIVDGVVTGEIEGYDVA VV
ELPHGTIRLAAGIELDVGVLTNVSPEHLDEF GGSFERYVRRKLTITEMSEVLVAGYD
25 CEELRKRLND AVWYSVRDPADY YGRRENGRLVVKGP DASVEADFH LIGYYVENC
TGAVAACLEFGADPEGVAEGLATFEGVPGRMELLGEFSGRVAYIDAAHNPDGLKAS
LPPFRELADERGGRLLSVDNPDVTTERDKFEFGRIVGEYADFVAASGYNETLERL
DRSAAEEVVKGAE SAGCEGVA VDSVREAAEEVAARSEEGDVLLHVGPGVVNAYDR
VKRAFLRGLTSVLGEPSDEA
30
- <SEQ ID No.:1048;PRT;Methanopyrus kandleri>
MKHEIVRQALIYACEEMGALLRRSAFSPNIREREDFSCAIYDADGELIAQAEHIPVHL
GSMRWAVQAVLDEFGSSEMEPGDAFLNDPYAGGTHLPDLTVVAPAFHDEL VAF
AAVRAHHADVGGKVPGSMPHDAEDVYSEGLRIPPIKVAEDGEPRDDVLRLLANSR
35 GGEERRYDLTAQIAA AFRGCRQVRRIDEHGREAWERACEWCKDYAERRMRVAIE
RIPDGEYSGEDYLEGDGISED PVRSISVTVRVEGDEVTVDFGTGTDEQTRGPVNAPLP
VTYSAVFFALKALDPETPVSEGTYRPIEVIAPRGTVVNPEPPAPVCAGNVETSQRIV
DAILDALREAIPLPAHSHGSMNNVAIGGVGFAYYETVGGGAGASPCDCGESAVHV
YMTNTANTPVEHVEREYPIRILEHTVRRGSGGEGKYRGGDGIIKRYLALERCRTVI
40 GDRTMHPPRGVDGGKPGKTSEYEVE RSNGKVERLGP KDSTVLEPGDMLIVRTAG
GGGYGKGE
- <SEQ ID No.:1049;PRT;Methanopyrus kandleri>
MEISEFQRLMDELYGEKDRKGPRTLLWLVEEVGELAEAVRKND RQAVREELAD
45 VVAWTFSLANVLGIDVEEV LKEKYPGRCPKC GEIPCRNE
- <SEQ ID No.:1050;PRT;Methanopyrus kandleri>
VKDGVLTAEAGLVGRDLELLSPITIEIEDGRVRRIEEGREPGADDDFDVVLPA PFNAH
VHAADWAFRHAGLGMPLKVVAPPDGLKHLLEKVGERELEVSIRD FLETSLSFGC
50 PGVADFREGGVEGLKLGLRAAEGFPTYVPMGRPKALDDPERVEEELRVLS ETEFV
GIPDVHL PDDVLEAVRDSGLRVYVHANENWRSVRECVREHGATEIERAVD LLEPEG
IVHCVVLTDRDRELLEELDPVILCPRSNDYYRLGNPDPRRLRGLRVLLGTDNGMSV

EPDPWAEAYHAWIRTGLSPLGALRALTVEAASVFDLPILEEGRRLSAVGLKGLPLPE
TVLGSQRQLAAHVLQLIKTSRVHVLLGAES

5 <SEQ ID No.:1051;PRT;Methanopyrus kandleri>
LTRYVLLDGSEASFEALEHALEEADEVIGVYLIDCRAFKGLNEDMARALEEFMRQE
AELIRETVEKRGAEFEIVRGEGPEAVMEYAREVGADAVVGVGHIPRFEDITFRRI
EGHVRDVPVVLVPSR

10 <SEQ ID No.:1052;PRT;Methanopyrus kandleri>
MCCAPTVPENRTGVRDVSEADAFDMACRELVEKMLSSEIRTKEGELQEAKREVCRK
YGLSKFPTDADVLERATPEEREKLEIIVKKPVRSSISGVAVVAVMTKPYPCPHGRCA
YCPGGPEKGV PQSYTGKEPAGRRAKEHEFHPRKQVEARIRQLEISGHPTDKIELIV
MGGTFPATPLCYQEWVRECLNAMTGKDALTIEEAQKYAETSERRPVGITFETRPD
YCKEEHVDHMLKLGATRVEVGVQTIYDFILKRVDRGHTVKDTVEATRILKDAGLKVC
15 YHIMPGLPGSNPERDLRMLKRLFKDPRFKPDMLKIYPCMVFEEDTPLYDAWKRG EYE
PYDEETAVKVIAEAKHRYVPEYCRIMRVQRDIPAHLAAAGIRKTNLRQLVHDYLEEK
GWECRCIRC REAGHRMRQGV EVDPGRAELRIIKERTWKGGMDYFLAYEDPEADAI
LGYLRLRKPTELAHRPEIDPETAIVRELKVVGPTVPIGERDTDAVQHRGLGERLMRK
AEELAASELDADKIIVISAIGTREYYRKLGYERVGPYMGKDLT

20 <SEQ ID No.:1053;PRT;Methanopyrus kandleri>
LPKIPVGLGYKLAYKGAKLGLWKWGTTAKTGFFSLIHSLIFGPLGVAIVATL FHEL
HYLACKLLDVPASPPVFLPLGGAFVQHGWTDPDKEVFIAAAGPFGGALAGIPLLVIY
PKAAVWNGLIQLFNLLPIPLDGSKVLRLGLWMPSPATAWIGVATAVLAAALSLVGILM
25 GLHA

<SEQ ID No.:1054;PRT;Methanopyrus kandleri>
VSPRPYGGFRFSRRSCGSRGGSEAMEVTELEGLTISWDARPLAPDSVYGEDYMRI
YRNVAGLLKIVQKAFDEPKGDLAIGFSGGKDSFTCALALEPFLREWDVNPKLVTVDV
30 RVRGVEVWRPYRKELDRMAKALGYEFELVRAEEDVAEPSEELNKPPCKICSAIRRR
ILAERHDVVYGHATAEDAIETLLMSVNRRRDAGTFPPADLLEDDALLRPLYVSEL
RTARVYHEVTSRLGLPKVEPECPYAKRYRNSDSPRRTASELVERLREIARVRDELA
VENLARGLARMALADVLCGRGRLEMPSS

35 <SEQ ID No.:1055;PRT;Methanopyrus kandleri>
LALVYHEEYLRHEQHPTHPERRERLSYTVDRFEEEGLEIEGIDLVEPDVPDREVIEL
VHDPEHVELIRRMSESGGGMIDLDTAVAPETYDQALLAAGGSVLAVELVVRGEYDT
AFAMVRPPGHHAGRAKAAGFCYFNNAIAAEYAIRELGVDSVAILDWDAAHHGDGTQ
EIFYDRDDVLYVSIHQDGRTLYPGTGFPYEAGEGPGEGYTVNIPVLPRSGDRTYRE
40 AFQRIVEPVVREFDPDLILISAGQDCHFTDPITDLAVTAEGYRWMQMQRATELAEDLG
ASGPVAVLEGGYSVEDGLPYTNLGVVCGMAGVPADLREPMDPQEENPRGPEGVR
KVAREHSRYWTSVKA

45 <SEQ ID No.:1056;PRT;Methanopyrus kandleri>
LRFRTAILSLFALTAVMAYGALHLNVEVDQTKYLPDRFESMKWQHVVVERELGTSTK
TLLIVIEADDVTRKPVLDYMRRIEDRLRSKPYVENVRGAPDVLRESPANFPAAVTMP
GLRPLMSEMERSEKEMFVSKDHKVAIRVGLKSDADYRKVVPDVRRLERDKPKSVK
FADVTGSPAINYDFYRGFLKDLVTALVSAVAALVYVDFRRWWAPVLGLTIIILSAV
AWVLGIMYWLGFAPFYATVLLTVLMLGVGIDYVIFTLTRFQEEYDIKGRAKGEAILT
50 AVRRAGRAVLITGLTASAGFAALALSEFRMVSEIGLGIVAGILTAVALTLLVLPSSLQSI
PIGRKSSEKKEESWKVLSIPVRHPVPAIVALLAITGLLGYGAAGVKPEVNIEKFLGHN
LPSLKARDVLEKHMDVSHHFATIVVEARDVRDPKVVRFMELKLRDAKRTGVAARVF

- 5 GAPDVIGMEKTVERLPAPIRSALEPKVEDMEKGVISGDGKVAVIQVQLKPGDPKVQ
GRKILDMVRHEHPPTGVKVGVTGLPVAFAMHEQVNE DMRRSTIASAIGVLAIPTIA
FRNPIPPVFGLVAIGSGILWAIGLLGGVLRIVPSFLAMQTTICILLGIGMDYCVFLASRY
REERKEHGVKEAWHTMERAGPGVLFSGLTSAIGFLSLLL SHTGIMRNMGLYQGIG
VLSTLTLLVVGFPALYVVISRVFSRGR
- 10 <SEQ ID No.:1057;PRT;Methanopyrus kandleri>
LSLVAARNPPDPRKLGSFKVRRCAACGRMLRIELSECNCVRCNDLRGEPLLEGPYI
ENSGPYCDRCRGGVEPTSRLPEVAVAVCFLTDRRNHVDLYRAAGALAEVVPRLRE
ERRFVAVGTPVDDLYFNLRCGMEAGIDFGIRAQMSSIFTHMGPEYLVIAHNVPVKLR
GRPRERFRYTLNESNIEELRRVIVLEDVVRNTDFKSVYRDLGREYPDVFVFASSGEVE
KLVDALRK
- 15 <SEQ ID No.:1058;PRT;Methanopyrus kandleri>
MIPTLTGRTDDPDRLMRGLEELGWTVREKGDRLVAISPGGQQVEANRETGELRITG
RGEFTAARTLVKLAVKLGAEEVELEGLSSEDRRLVYGPVPSRRLGTSLGIDLPRGM
CTHDCEYCSVGVSRRVSPHERFTVDPVAVREELSETLRRCDPDAVTFAGVGEPTL
CANLREIAEEIRPLVEGVGAEVVLLTNSTWVSECADVVDVAVASLDCAREDLYRTIN
RPHPDMSLEHLVEELSQCDDPGDVVVEVLLCRVGKITNADPDHLRELADLLGSIGLER
20 VQLNTVARPPARGRAEPVGRDELLVARRTLESCGLEVSVYR
- 25 <SEQ ID No.:1059;PRT;Methanopyrus kandleri>
MQMLAERVLKWGPILVPALALIGLPGLRVILRSRVASEGEARAVVRRAGLYLGLASP
CAGVAAAYTLVSGSVLLGRPELAAWTGPALILTPVTLLLSYVPGRSESMAKAMLVS
SLTTSVPTTTAVWYALSYL
- 30 <SEQ ID No.:1060;PRT;Methanopyrus kandleri>
LKIAITGTPGVGKTTVCEALRDLGFDVVHLNKKVAREMDAILEEDEQRQAKVVDLHAL
RRYVEEWEPESDPAFVESHYAHLMPDVLVIVLRLHPSELERRLKEKGYPPEKIAENL
EAEFVGVCYGEAVEVRSEGCFIRPPEDVIQVNVVTGLSRAEAADRVLEAVNHRRGDD
VDWLSDEEAQRTVERYLKYR
- 35 <SEQ ID No.:1061;PRT;Methanopyrus kandleri>
VRRREVLRLREDDKYRHPAVLDEGVKIIIGDNLADVTAIEIGAYAEIGPSVWIRRKAAI
YGFCRVFSDSDVGERASISPFISVRADVGNDAFIGDGS MIGAIGEDRAKLG YDCFIGM
RCVVYGGVKVGDGAIVGAGSVVEEDVEPYTVVMGRPAEYVGDTVIRISANTFVGGE
EASQAARMVTRGYDTGWETLGCTESRGVNLT VVTFDREVWERLMG LLGRFRGEV
DHGTFRFEGVEFFGIAASSERPPRRVVDKIRELLERAERLVACILDCPKGYGRDVV
40 VRSGRISDERVTGPLRARGSRYYRTEEGLHTV
- 45 <SEQ ID No.:1062;PRT;Methanopyrus kandleri>
LKVA VAVQGA VEEHESILEAAGERIGEDVEVWVARYPEDLEDVDAVIPGGESTTI
GRLMERHDLVKPLLELAESDTPILGT CAGMVILAREVVPQAHPGTEVEIEQPLLGLM
DVRVVRNAFGRQRESFEVDIEIEGLEDRFRAVFIRAPAVDEVLSDDVKVLA EYGDI
VAVEQDHLLATAFHPELTD D PRLHAYFLEKV
- 50 <SEQ ID No.:1063;PRT;Methanopyrus kandleri>
LACGIAGIVLPEPGPVGAILTEMLDALQHRGPDSAGYGLYRDVDTAVFVLELPAEDG
EMELLSEVERALEGRQLKRVERIAEDAGTRVYRLFVEGFSTGRQGQRELA EVVEKI
ENSDITVLSAGHGFEILKDVGTAAEVSEQYGV EAEIGTHGIGHVRFSTESEVD RYHA
HPFQSYMIPNMAV V HNGQITNYTIRERLEIKGYQFKNNDSECIVVYVADKL RDGY

SLEEAMEEAIRDLDDGPF CFIISTPDAIAVARDPLGLRPGVIGFGKDGAVAVASEEVAL
RRIFGDELEGIEQIEPGEYEVFEVGGRG

<SEQ ID No.:1064;PRT;Methanopyrus kandleri>

5 LKERVIDCRDKEPRDINSALKTYAREYDRIVLENPGAKHYIAAGLTEEVEVIKGSVGY
YVGTMIHGPRILVKGNAGWYPGDNVTKEIVIEGHAGDGVGQGMYYGGTIVVRGDA
GSRVQGIMKNGTVIVGGDVEIMTGMYYMMGGTIIVLGDAGTYTGESMLRGEIYVLGE
VEDLGKNAEAVDPNGEDIERVWELVRAYDFDVTRDDLKALTIVPRSKRPFGYSEE
MEEG

<SEQ ID No.:1065;PRT;Methanopyrus kandleri>

10 VATTVVLCSGGLDSSVIAKWAVEELGGRVICLFVDYQQRNAPFERRAAERIAEAVG
AEFETVGTFWLRRLLCPDNPMFAGRLPREAGTEDLSANWLPARNWNLLGVAAALCD
HLYLEGEDDEFHIVWGINAEEAERFPDNTKEFADAVAEALKRGLPSRRLHSPLAEL
15 YKPGIVRLGSELGAPMELSVSCYNPIWEDDTPVHCGECEACYHRKRAFERAGIEDP
TEYLE

<SEQ ID No.:1066;PRT;Methanopyrus kandleri>

20 VGLAGYLPVELCRFVRNPDPNTSGKRAEQLVRRYGPYLGVLTMVLFGSYITLATM
AVAGLGGDRRAHLSALAGSMLLALLGYGATHHTLRALQPWLMGQEWGEELLRRFG
IR

<SEQ ID No.:1067

25 MVVDKHARDAIRSGALSVFAPAVRRVRGRFRPGDVVKIETATGDFLGYAFAQTSR
DVRSGRAPGIVARIFDRKGEYPERSPDEIVLERIERRYFRKRWKVDAHRDHMRV
FSEADDVPGILDKFNDAVFTTCAIERIILRNAAEELLEILDVDTLYEKNSRKRRL
GMEVRKRWWAGEERVETVVEEYGVRFVAVNVEEGQKTGFYIDQVENRAKVQELVDG
GRVLDVFTYVGGFAIHAAVGGAEVVGIDKFDRVVQAAAYRNADLNDVRDRVKFLVG
DAFALLEKFERRGEEFDVVLDPPAFVTSKEHLNRGRRAYFDVNYKALGLVRDGG
30 FVTCSCSHFLEPSDFVRLVNEAAARRSVRLRMLGPLRGQPPCHPIVPGNPDPTRYLK
AMFCAVEH

<SEQ ID No.:1068;PRT;Methanopyrus kandleri>

35 LKDDKGGKRLFRVRNERHERYLAVAVPLLAHVFLTTSPVMMNWDVHYFEEWYR
VAMSKGLLHVYPECEKVHYPPMAVVFYITTRDLIHNGLDSNPWTFQFSKIFLVAFY
LLTCLVIREFEWPIAQWGVISVPMGMVWGYQFDTHIAFFLALTAVCVRRGRPIAAG
VSLALASSFKYVPGILVIPFTLILKEKYGSRPAKIFLTSITVALLWSPFILDPEAFWK
QAFLFHMLRLPQDLTPLNIPLLLTRWHVYPYHFIIGKLSGPLIILGFVTALWLWKRRE
ILQESIRTSGLKHTIWGSAALFMLWFALTTKVGNPYIAWIYLVVFPFAVWLLPSWC
40 VGFLNTAPFLLALSRLPAAVCNAPVFPEDVRWYPALQLLGFSTPLAVEKAHQLYLA
APNFMRLWYYHMHQTELVLVVYTVTKTLLDLLKWIRDPKPADERPHDWAHPM
LLAFTLPAYIFALYIALPIG

<SEQ ID No.:1069;PRT;Methanopyrus kandleri>

45 VSKVAVIGATGRVGSTAAARLALLDCVNEVTLIARPKSVDKLRGLRRDILDSLAAQK
DAEITIGCERDDYVDADVIMTAGIPRKPQTRDLTKDNAAIIKKYLEGVAEENPEAI
VLVVTNPVDVLTYYALKVSGLPKNRVIGLGLHDSMRFKVLIKHFNVHMSEVHTRII
GEHGDMVPVISSTSVGGIPVTRMPGWEDFDVEEAVREVKEAGQRIETWGGSQF
GPAQAITNLVRTILQDERRVLTVSAYLDGEIDGIRDVCIGVPARLGREGVLEIVPIELE
50 EDEMRAFRRSVKVVKKEATREAMEAISER

<SEQ ID No.:1070;PRT;Methanopyrus kandleri>

- 5 VRLKRLSTNHLLSIADLDREDVETVLRVAERFKERYLAGERVIPILEGKTLGLIFEKPS
TRTRVSFEVAMHQLGGQAFTYTKQELQLGRGEAIKDTAAVLSRYLDGVMIRARRHE
DIEEFARYSEVPVINGLSDLHPCQALDTAFTIREKLGRGPHTVAFVGDGNNVCSSL
ALVCATLGWDFVHAVPEGYECPDRVWREVERRAEESGSETRVVRDPKEAVREAD
VVYTDVWVSMGDEAEREERLRVFRPYQVNEELMSHAPEHAIVMHCMPIQRGYELT
DDVADSERSVIYDQAENRLHVQKAILALLMG
- 10 <SEQ ID No.:1071;PRT;Methanopyrus kandleri>
MLKVLLVSGSGAREHAIAEALCGAPDEDVELYAFMGNRNPGIIRLAEDYVVGDPDPTDVE
AVARAAADWNVDFAVVGPEPLAEGVADRLEEEGIPTFGPKRGPARI EW DKG FAR
ELMEKYDIPGRPEFGIFEDPDEACDFIDELGKPVAVKPAGLTGGKGVKVVG DQLKNL
DEAKEYVKEIFEEDIGGIPKVIIEEKCVGEEYTIQAYTDGEKVIPTPAVQDHPHAYEGD
KGPITGGMGSYSCPDGLLPFITKEDYERSVEILERTVEAIKKETGEPYRGVLYGQFM
LTAEGPVVIEFNCRYGDPEAMNIPAEAGDIVTLHASIAEGSMERGEIEFLEKATVCKYV
15 VPEGYPESSEGEVDVIEVDEECIHYDAVPYYASVNLDEDGKIRMTSSRALAIVGIG
DELEQAEEAAESAIRECVSGERIRHRSDIGKHETVEKRVRRMKRIRGE
- 20 <SEQ ID No.:1072;PRT;Methanopyrus kandleri>
MVMNRERLAEMLLEVGALKFGDFVLSGKRSYYVDIKEACTHPKVLDALTDALLE
VLPDGDVLAGPELGAVPLVSVLSVKAGLPMAIVRKRKKEYGTGERIVGDVRGRKV
LVDDVATTGGSLLLEALEAIEEEGGGEVRDAVVVDRQEGAEELKERGVRLSSVLTA
DDLRLRDAESTARG
- 25 <SEQ ID No.:1073;PRT;Methanopyrus kandleri>
MVEMGSGAWLELGKGLWFILPAYIANLSACLFGGGRPLDFGKKLS DGRRL LGDGV
TIRGFIVGLAGAVVGLGEGLVVGDPWKAGDGFILGLGAMAGDAVGSFVKRRIGLE
RGAPAPVLDQLDFFVGAVLLYYLVYGWHPPGWVLVGLAILTLALHWLTNVIGYLLKL
KEVPW
- 30 <SEQ ID No.:1074;PRT;Methanopyrus kandleri>
VSDTLYETESLCPCELRVVPARLVRTAEGSVEIVKKCPEHGEFREV VWS DVEFFER
AFEYEFKGPVENPQTDSENGCPLDCGLCPHESTTALGIIDVTNRCNMNCPVCFA
NAEAKGYVYEPSLEQIEEMDLLRSERPVPAPAVQFAGGEPLVREDIVEIVAAADER
GFHVQIATNGVEFARNPELAEDLHAAGLVVYLQFDGLNPEIYEEIRGSRKVLELKK
35 EAIKVLEREGISTVLVPTLARGVNDDQIRPMLDFAREFEVIRGINVQPISTGRTFREE
RERMRTIPDFVKLVVEEQTDGRIPAESFYVPVIAAKIARLIGQLHGKRKPEFS AHPICG
VATYLLDEGDWYRPITDYVDPDAFIDALEEVAEKAGSLDRKRDRAKAAWIVTKYLRR
VFKGLTGKRKLARLVLDVVTGTYDALADFHWNALLGCMHFMDPYNFQTDVRVR
CVIHYATPDGRIVPFCPYNSIHREEIERKFGVPLEEWKERRNG
- 40 <SEQ ID No.:1075;PRT;Methanopyrus kandleri>
LPLREAAERVVEAETVVVLTGAGASADSGIPTFRGKDGLWNKYDPRELATPEAFAR
DPEKVW EWYLWRRRKIAEAEPNPAHTVLARMERDGLLEAVITQNV DGLHQRAGSR
RVIELHGNIWRDECVSCEYQQRVNDPERGEGLEYDELPPRCPECGDPLRPGVWWFG
45 EPLPSDALVEAENLARS CDV MLVIGTSGEVRPAADLPLVAKSCGATLIEINPSETALS
PHMDVIIRERAASAMEALWNEIERLL
- 50 <SEQ ID No.:1076;PRT;Methanopyrus kandleri>
LSDPLKGIIIEIRADLGYKESEDLWAASFLCELLRDHPRVLRPEDLPVEEEVVVVG A
GPSIAELPKIVGELEDSVVYAADGACRALLELGIVPDVVVTDLDGPKEYLLMSSECG
SITVVHAHGDNVTELAELVPTLGRILGTCQVEPPCDLLHNFGGFTDGDRAVVMAR

LGAERVLTVGMDFGNLTTEYSRPGEGRGVFRADPVKRKKLAWGERVLRLVERELG
VEVESLTVRR

<SEQ ID No.:1077;PRT;Methanopyrus kandleri>

5 VVVVGIVGASGYTGGELLRLRLARHPEVEEVRYATSRRLLEGKPVWKVHPNLRRDYP
DLEFSDPDPVEIGEDCDVVFTAVPHTAAMELVDPDLLEGGAVIDLSADFRFDDVDVY
EEWYGVEHAAPELNDEAVYGLPELHRDEIRRTDLIANPGCYPTGAILAAAPLVEEGL
VDVWIFDSKSGTSGAGAKPSEVTHHPECAEDLTPYNPTDHRHLPEIRQELGKLGDV
10 EVHFTPHLAPLVRGIETTAHGLGDVEIEPKELRELYVEYYDGEPFIRVCEVGEAPRL
WAVRGNTNYCDVGVFVAVGDGRVVASAIDNLTKGASGQAIQNMNVRFGEETAGLE
EPGYHP

<SEQ ID No.:1078;PRT;Methanopyrus kandleri>

15 VRLEDILQMVETCNRKIDRTAFLIARSVIWDLEANGEVRKRAEQLGHEIVKRMEFSD
VEDACEYLQEIRCGEVQVGVEDEADELVADMGYDNVVYDCISCCGAPEMGETL
CAPGERPDPGDDRRHRRPGVLRDRVRMLGAR

<SEQ ID No.:1079;PRT;Methanopyrus kandleri>

20 MYFSKERKSQFRSGVTASTGDSGSRGDVALKVTVVVSDEPPLDPELRSGPGFAAL
VEDGRHRVLFDTGPDPLLLHNLKGLGYEPEDLTAVVISHNHWDHTGGLQAAESEV
ARIVTPERIGVKNELVREEWLIGDMVLTDLVLEGPPPERALYANGLLITGCAHPGIHE
FVEWCVRRGLEVHTVLGGFHLMGATEIEVEKVADRLEELGVKIAGPCHCSGEVAKR
MFRRRFEFLNVGPGLEVRV

<SEQ ID No.:1080;PRT;Methanopyrus kandleri>

25 LRVLQVVGPKDSGKTSFCEEAVKELRGRGYRVGYVKSXGGHGLDLQDRDTGRVP
ADVRVGVARKETVLFDLDDIDAVLGLLALLGLDYVLVEGFKSRELGVRVGFGGYTEG
PTVPAEEIDTSPADAVERYAVKYTADIDCGRCGPGSCRDFRAVARGEENPDGCA
APEDTVLVDGKPLGLNPFVGDVKSXV

<SEQ ID No.:1081;PRT;Methanopyrus kandleri>

30 VTKVAVEVYGCAANHDDGRLVRELLRREGFEVVEDAENADVAVLLTCIVRDSVDAR
MVNRMRELERVPTVVAGCFPEAYPERARKLRPDAALVGPRHLDRIPAVRAVLRG
DRVEFLGEREDIDWKADAPRELPLNLAIVPIAEGCPNRCAYCAVKLARGNLSFPPE
35 RILRRVKRELERGAVEIHLTAQDTATYGLDRGTNVVELLEDVVDLCSRYGARVRLG
MFNPGHAYPISDDLADLFASRDDVLYRSIHMPVQSGDDEVLRMRMNRNYTVEEALEV
YRAFERRLGYSFITDVIVGFPGETEEAFRNTLRLERTRPHILHASRFRPGRPAA
RMEDQVPEDVKLRRSRILHRKRLEWAEANRELIGETVEVTMVMEKWGRDEHAKK
TVFRGEVPEPGERLECRIVDASHARLVAEV

<SEQ ID No.:1082;PRT;Methanopyrus kandleri>

40 VAIIRSVGRAASNPPVLIKIVLGASPVLGIVFLSTLIVLGSTKLAPVSLSLIAAVLTSAP
FQVLVSRVILDTLFLFTFIPIPGIILSTIFCTVCSIIILYNELTQLFNIKISLATTIATPMATLA
YMFTAASAVSWARPGLIARRVTMPWALFVIFSLMIIHADQAYLVASTILVAMMLL
45 SFIDVIQGVNRISKISIFTRGNLLIKSLKVAIAAFADYSVMMMSAIIYYLVMMFFDKFLVW
SKYGFYFPLDSPSFVGMPLFAGTLAAIKFWDSVEEKLDLLYRVDWDGMYALREF
VMKAYWRSALWTLVLAGLITLIMLAIGISVHRTLGYISLAVLGALSFFAGLGAVKLPR
KYAIPLLLATGALFLKVHVSNIIVLMMYLIGSLPGAIIYIYPQLLTFRRDLEALLVTS
50 AVPATELLVWKYFGESFLPMGYLTGAILAAGLSLIFSIRMYWRISREAYRVVAYNAFV
SYVTEIPRRWG

<SEQ ID No.:1083;PRT;Methanopyrus kandleri>

5 MVEFRGSGMYKRPTVTVVTEATYPVALGGVTTWVQRLLIKYSPDVVFNVLCMTGPE
RTEPVVEIPANVRDVIQEIIVPKGNKLRRWLDRIPTHRLRWSTA AKTLRATFERMV
EGEPLSEPMKLKELWKVSKSPTSVLASSTMYELARYVHYLASQYEDKCENNPFSDF
WVAVNIASFVLGAAAGARRLPNCDAHAQNSGVCGFLCSVAKAVRNVPFIITEHGIL
10 LRELDTRLEGYGRRTTREL FKECFRSMMLTSYEQCEEIIEISDYHAELALEQGAPEDI
KVVYSGIETWKYSPGDLERKYNEPEVLEVGTITRIERVKGIDVLEIAARTVEHIGNVV
FHVVGPEDEAYYEECRKLVKEYGLEDIVRFHGPCTPDEVVKWLRRFHIFLLPSRSE
GLPMALLEAMSCGCPVASEVGAVPYIVDRNFGRTFRSEDADEAARHLVRLLYDPE
LMFEMAHHATKRAKQYDVMMRMCHDYFREYCKYARGD

10 <SEQ ID No.:1084;PRT;Methanopyrus kandleri>
VSVRDKVRVLRCD CARVLEVEGVETPAPFLIPERLSVAVENVPEVREL VKELEELAR
PYSVRLTPDDLPSWTDPAEALSDGSITVYRLESIPDAREFAEVVSKIRRS GSVRAV
TVRDPEWIPLLFYLGFDFDAALCLRLTLEDQLLLDDFSTETVETEDREELLRENWT
15 QLQFCLLRLREAI REGTLRELVESVAARHPRIAEVLRVCDRERAVARYVNLNRNTQI
ACATDLSFDRPEVTEWLRVRVRYEPPDWVEAVVLLPCSARKPYSRSPTHRIMRIT
WNFPVDEIMITSPLGAVPRALERTFPAAHYDVRVTGEWSREEIERSAALIEKIVGDLP
IVCHAADGYRKVGKELEERGYDVVYTCRPDGNPASRGAL EELRRTLEDLTKEGEPG
DLREHVPRAVSRFQFGVDVLENDYRFDGQRVLDIGERAFSVPPTSGLLTSQLGA
20 ELCVSSRVPIHAE EGTKAEMVDVPEDVLPGFHWPVDLGDEIRPCRVIARPEDVPP
DTTVIETR

25 <SEQ ID No.:1085;PRT;Methanopyrus kandleri>
LPVHPIESRYGSDELRRVFSEENKVAKMLEVEAALVRALSEVDFVPEEAADEVERV
VEEITGDEEELRRFVERVKEIEAEIKHDVMALVKALSERCEVGGDYVHLGATSNDVI
DTAHALVLRALSIIYRRLHRLAEVLAEKAEYADLPMVGRTHGQHAVPTTLGMKFAI
WAREVVRHLKRLRECANRVLVGLSGAVGTMAALGEKGPEVQRRVMELNL RPVT
VSNQVIQRDRYAELIAL LIGSTLDKIGREIRNLQRTEIREVEEPDFPEKQVGSSTMP
HKNRPIRSERVCSLARVLR SNVQIALENVPLEHERDLTNSASERVILPEQFLLDEML
30 RLTIHNLEGLRVYEENIRENLR LTKGLNMAEALMV ELVKRGIGRQEAHELVRRLAMR
AWEEGRDFAEVVKEEERVRELFGEEELDEVLDPEKYLGVAPDLAREAAEKTRRDLE
EIDREMKEVLGVGAG

35 <SEQ ID No.:1086;PRT;Methanopyrus kandleri>
LVRKVRLVGCRCGYCSQVVDPCVGDPLWNREDCVGC GACVPACPYGARRLVEV
EEGPITVRVDGEEVEVESRWVEGALREIGHDVPDAPCGVGGCYACAVRLNGEVVPA
CNSKLTEGDEVETEDVDGKIRVVS GFQPHPVGGVGT PVELKDKPGYVEAACFAHG
CNLRCPQCQNHSIAFGAAMGARMRPEEAARLLVGTAREYGVNRVAISGGEPTLNR
EFLVEFVRKCREYGGPDLRVHVD TNGTVLSPDYVDELVEAGMTDIGIDVKGFRPET
40 FAEVAGIDVKGA AEYVDGVL RILEYLADEYLEEVFVG VGIPYNPELVDKEEVFALTD
WLYEHLGEDVQVCYLDYRPEFRRDLPLPKYEDMVELEEYARSLGFRRVHAQKVS
VRR

45 <SEQ ID No.:1087;PRT;Methanopyrus kandleri>
LLDNVLEIVDDEDVEEVIDIICEHAKTGRPGDGMIFVIPLEDAVRARTGDRGKDALS

50 <SEQ ID No.:1088;PRT;Methanopyrus kandleri>
MDVTKLVIHYLLVIAKVAPLVFLGFFLASVMILRVHERLGKLTGRRLARLGLTPEAAS
AMAASLVSPSAGYPILAEFRREGRLDDRDVLLVATTFTPTTVGEMFLKGPFFAALA
ILGPKLGTEYMGALFVTALLQTLPALALYGARSGNGSDIHL PSTSHDDVPPLREAVIE
GLRRAARRMKYVLP RMVIGILPMVILA EVLRVHVGGLGPVVAITLANVSHYTVGY

ATAAELVHRGVLSESEAVAALLIAGCANVLMIFLKASLATYVSIFGSRLGLRAWAANL
GSSVGARLLMAYAILRWS

5 <SEQ ID No.:1089;PRT;Methanopyrus kandleri>
VAEENVIVGNKPVTNYVLAVMTQFSEGADEVKLVARGRAISRAVDVAEFIRNNVM
PEVEVKDIEIGTEEIEETEEGDTISVSTIAITLAKPSE

10 <SEQ ID No.:1090;PRT;Methanopyrus kandleri>
LPELPSVEDLMSRNPVTVADQSLKFALKTMKRKVNRLPVTERVSEDRKELVGILT
VLDAALAVADAMFGDRSPSRIKVSEVMSSPVITISPGATVLDAAQTMLVHGVSGLPV
LDGDRLVGMITKTDLLELVRSEDYVALHMKDPITVSAGTSLHARRLMFEENAKVL
PVVERERLVGLLTDRTLALRLREKSPKGFERSALKRARVDDVMRTPISVRTDYG
LVDAAEILVRKRVPGVPVNYQDEVGVITKTDLHLLVEELEAAG

15 <SEQ ID No.:1091;PRT;Methanopyrus kandleri>
MAELAVGIDVGGTFTDLVEYDGRELRVRKVPSSPRRPERGFAEALKIVETDPDVVL
HATTIGTNAFLGQKGLELPEVALVTTLGFRDAIEIGRQVRPQTYSLSRKPEPLVPRR
LRFEVKERTSPDGEIIVPVEDDKLRRRIARRIAVEDVDVVVAVFLHAYANPANECKAKE
VLEELGDVEVVCSEVVCNEYREYERTSTALVNAVLRQIVTEYVERTWDAVRDAGA
20 SEYYLMQSDGYAVPAELTLHTPAKLIESGPAAGVVAARYLGETLGRDRLVSFDMGG
TTAKAGTVVEGRYEVTKKEYEVGGEVHRGRRVRGSGYPVLHRFIDLTECSAGGTIL
WTDEAGALRVGPLSAGADPGPVGYGKGGTDPTITDANVVLGRLNRRALLGEMPI
DAEAADRALSELADELGLEPEEAAYQALRLAVEEMARIVRIVTVERGHPREFSLVA
FGGAGPLHAAELAEILEVEEVIVPLHPGVFSAYGLLAAEVAWEHVTPVMRTLEELDD
25 EELRAVVRGTAEKAAERLPREPDDVRIVVEARYRGQAHELEVQTGPDVTADELEEA
FHERHRAVHGFQLNAPVEIVNVRALAVIERKPPSPKKEGEGNPKRALVETREV
YFREEGYLETPVFDRDALRADDIVEGPAVIEQYDSTTLVPPGWRARVHRSGAILLHR
IE

30 <SEQ ID No.:1092;PRT;Methanopyrus kandleri>
LAGKAEILGEVVLCAVIYGYRVAGAVSEISGLSSRWYGHARSTEDLAVRTVEELGRS
LGWDPEEVRRWQAIVRTIGDLARRGLL

35 <SEQ ID No.:1093;PRT;Methanopyrus kandleri>
MRVLGLDTGSTHVDVLEDEGEDRVKVPDRDGKLEPTRRALRALDADERRVST
TLPINALTRGRTDPVHLVLIPGPGLDPEPLLDLADRADVLPGYVDHRGDIVEEPDPD
AVEPSGEDHALAVVAKHSHRNADPERKIEAHRETYVEAVPGYHLPYGNFPRRVAT
AVLGARVKRVTRRFLEALGRVDGVLRGDGGQLTPEEALRVVPVNLHSGPAAGVLG
AAYLTGRDDFLLADVGGATIDLTEARGGRPVTTEGAELFGYPTAVRAAIVRSLPYGG
40 NAVLTGEGITNDTATPACYGGSEPTLTDALVVAGYHDPEPDGDPSKSRRVLRELGD
PHEVAEETLETIRRELLRFETHDSVLWAGALAPALRELTGVGEVVPVHHDVCNAVG
CAVARHAREAVVYVHTERGYGHVAPAGERFEVDRGRVYSREELVELAIEAAGFEP
DEVVRFAFEIVRGGVRVGQWAEVYLYRTPGVEPPS

45 <SEQ ID No.:1094;PRT;Methanopyrus kandleri>
LTPIDPEEDARLEWERSMARLGLKYVPTVVISRVRGVALTLEIFAPVSAPAGSSAIVF
VRPYLLTLRGGGPLWEGTLEFRLNGAGNSELGRIDLSEPEVWVGDWVEFEFYTPPE
ESGKYRLVVRYEOPYGTVREEFQLRIVDD

50 <SEQ ID No.:1095;PRT;Methanopyrus kandleri>
MEFSYAAMVAVLAAARGFAPVFVEHLPCESCRGKNCEIIRSSRCLMVATTELLCDV
NVGAHVFFSDDLVLVYRGVGDPESGISIHVDHAGPDAARRILDRAGDALNRGLMFIA

TWDARHGPPEEFERHAPEALNLDVTGLTLPIDRTGLHPTDFRVVSAAEVRPEDVA
DFSDLDLVDGRRYVDPVLTAVA EVLGERAVEGLGAIRLEAPQGETLEWWMDSVK
RYWKQLRVRSALRNGPSELAAAFWISILEVGTRLASDGWSVDRDRTVEDAMRKSAR
MTEALVPKAIRSLLLGLAVLVEGL

5

<SEQ ID No.:1096;PRT;Methanopyrus kandleri>

LKWWVEVPVRPKPSVLEKLHAAVSEPCEVLENFELFRAMISTLDPDKPLVRALRGE
EIHVHPVRFLLEEVLD PATLVDAVERITRWSLSGVFELRVALEEVTETPDVALGYL
LEIRRAFLSAVPKYLEEPCLETVAGPLLVEALMACTEGFLEDEDLGKAAELVAKAV
10 DTDQCIVEALPSLEIQYGDIVPKFASPARVWTIFTLLCHTCANRLPPEELAEPLNV
ELGPVEELELLNGYLEEAIAALEIEDERVERWISDILVDTVERAAELIQLLSQPTLAE
NILNSGATVRVGWIEIEPKYDPLWEEKGAQESLYSRIKRIQNLIGVEHADEVIERAS
ALGGVELPVGGGVEVESSVETLRRMIG

15

<SEQ ID No.:1097;PRT;Methanopyrus kandleri>

LAGRPSIRYRYGIAEIPGDPKLAYETMWAALQGEARRIFDGLSRRLRRDPSSFHRSV
ERLWGEVRRRAQVSPALWELARELGLPEGTNLLNLLGRLLGLR

20

<SEQ ID No.:1098;PRT;Methanopyrus kandleri>

LAVFALWSLLRLLWGPRAGPGTVVAVVNLTA VGAATWALFSGHWERLSEALQARS
TACLVFFAVTIPLTVYGAWRIIHDFRRRLCGRPDPRDVAAARVLLQGARKLWKSSEE
RGFG

25

<SEQ ID No.:1099;PRT;Methanopyrus kandleri>

LDWNDPLQPEESALEKLHVAMPKPCETLGDFEIFRRVVLSTLESCEGLAGLLKGEGI
EETHPIRFLLEVLDTPSTLAEAAERLIHWISGVSGLWEGLRGTVDPAEIVLLHFLQL
RRFFVRRTPPEYLEDPGLESVLEPLSVEALMACAGGLLEREDLKEAAEYVADGVGV
DERVLELLPELGVRYGSLVPRFASPTRVWVIFALLCHTCANRTVPPEELVKPLKELR
PGIDEIEYSVREALHEAVGGLGIDDEEVLRWVGSILVDSVEHALELADTLRWEEL
30 AVKIPGAGAVIRLGEVEIQPGEYDPIWEPGPQEEVHESVVERVRELVEEEANGAVE
RLYELDMEEAGELVGDDALDDLLDDSI EELRKRRMR

35

<SEQ ID No.:1100;PRT;Methanopyrus kandleri>

VLETILLATVAWTVQDHDQPFATYWQDVKFWEILERHPRTLVD PYCGPDDRPWT
KDEIRTLREHGVKPVAYLSLATVGKHQTDLYSLAE EKGLGPRDPYWEGDRAVRF
WERTWLDALRTKFEELRDLGYEGVFIDVDPWTL DWYVKWFRRETGENLEKLREL
TYDALEELIQAALHLGLEVYVNVGGAIFDPKLAELKERYGFKVVEDVITDDEGNLVP
DDVFRDYLALAHLGSGVYVIEYDLTMTPEVNERLEELFAETKVEAVYVTS LDHDLRL
GIDIVPIKAPVNPSDTSGSSGEEKASYTRENEEDLERIPVEELVEEGPKKLPVIPVPP
40 VRRRCLSHG

45

<SEQ ID No.:1101;PRT;Methanopyrus kandleri>

LCLVLVEEATTVP TFPGALYVLDPPGEPGR LREGPELTDEEGRSVVPFVALVEPPLR
EVIRVEGTTLHVHPDAVVHVPDQPVVLTGYACDDRHTVTAVLPFRSFLVALDHAR
HGPPDPYELFEVFAILYDPIQAAAF TLNARGHALLIDEHGVNEHAMLYTTPPGHGPG
DHISSRHVRPSDLQGAPKHVTGDGPPI LPRDRYLDLLARTQLITGVPEPGRADFRLL
ENVHEYVRPLLTTHLAHHWETRQVHEETGRLVAEILRGDLHREVADAHKRAVRAL
GSRYPTPAYAPDARVRWARQLAGPVSDRVLT KVQDFARLVACHRLVNRLWTFVDT
VTLLGYEECVDLVEMASYTEHDLP GHEIERLLRPWIDALRDPHYRRLERGTAPPPK
50 LRLVEPEEPEDLLVCYDRLL

<SEQ ID No.:1102;PRT;Methanopyrus kandleri>

MVPRQHMGLWGLPHLSEDERLRKVKEALKSGRLSLTDAVLATICVAYREFNMGITC
DEIVKVLRLGYNNVNRKRIYSLASRLKKEGLIESNRVSGRAIYAIKDEDKAIERVLGK
TRSVKAEDLLKALEEV

5 <SEQ ID No.:1103;PRT;Methanopyrus kandleri>
LRCTRCGERNAEYERPYAGDAVCGRCLVELVRDRVFREIRRWRWFRPGQRIVVAL
SGGKDSSLALRLVTEYVEPLPEVEVIALTVDEGISGFRDACLAERVADELVEHE
VVSFEEYGFALVEEDVDVSACTLCGVLRRRLNRRARELGADVVTGHNLDDE
10 AQAALMNFVKADLAQLARLHPEVRPEDDLIVPRVKPLRGVPEREVRWVAEELGLPF
HADPCPYARFSVRSFFREILDEMEERLPDVKFGLVRALDRAGPVLAEAFLEEGLR
CERCGEPAAGKLCKACELLERLG

<SEQ ID No.:1104;PRT;Methanopyrus kandleri>
VDPEIALQGLREHSTVYGEEDRIVPVWFAFFPQVLTFLGWLTIVMAKTFPGHATFLV
15 LLGLLEALIGYPLAVYLMYLMIKRRNEHVTRSLGFLRYLVELLAGVGYDVIDLRSELE
EMRLHTERRNPVIYALLTLVPPIGWLVALYIYHFLNRDLHEHSVRERDFLESVARLLD
MNPHEPPFELET FYVPRRSTFLYFVLTLLTAGIFALYWWYTVVQDPNRHFRAHRR
LERDLIESIEQAFSD

20 <SEQ ID No.:1105;PRT;Methanopyrus kandleri>
VILTDPQVAGASGDMVLGALIAVGADPNRLEEVEHVSSLGHEVDVHVHEIQKRG
RAVRVEVDAEGDLRDPDELREAVKTVANVLEDWRPELALKYLLRAEERVHG
DLCHLHELGSSTVVDLVGTAALLEDLNPKASEVLPPNVGSGTVETEHRPVPAP
AVVEVLSEWDVGIVREGEGELLTPTGAALLRTIDELLDP PPPPYRVKRQGFAGTK
25 DLPDRPNVLRALICEPGGSGEHVRIVETSVDDVDGEAVGELIEAVLQLEGVHDVEVL
HGFGKKGRPRFVIRVVTEDRPGIEREVFRELFRWTGTLGARVYRCTRTADRRIVD
VDGIRVKVSRFEDVHHAKPEWEDVRRKVDRESAPLTRARLVGDLRKRYEGDGEDG
AGD

30 <SEQ ID No.:1106;PRT;Methanopyrus kandleri>
VKEVRLFVDPENVGRVMNAMADVGTGFYAIEYRGVAPDRWAGFEIREDPESAIKA
LNDLSERAVMIVTVVPEECVEKLKDAAAERLAGERYTIIVTDVEEIHVDYGR

<SEQ ID No.:1107;PRT;Methanopyrus kandleri>
35 MIDDGFSPESLRERAEAGSVFTAELLATNKMVMMALYSLGGERSCASVFRAGR
MLAGFFGVETLEDALHTFCELTGADYDLDRNYVAIESCPECLGYVNAEGAVCNFLR
GFISRAAEHELGEVVSVAQVACEATGDRRCEFILGERGEVGGFDTEVDEMTAEDIEI
VMSADGRDAVEVAAFKIASGELLRCALSDVARPMFFRAGRLYARAFINAFDPEDPD
ELIGHVEEISGSSYSLEGDRFIVEKCLECAGMPFKEPICHAVRGALAETLEHWNVPF
40 KDLVEVRCAAEDEVVGTCVVKARGVIWKAKRVVDAVKRAFH

<SEQ ID No.:1108;PRT;Methanopyrus kandleri>
LEYGCLIGGEWLEGDREIVVENPYDGSEVGRVLAPEVDVEALLKDAREGQRRWRE
RPTYEVREALAEAAHLLKKHEDELAELIALEGGKPIRDARYEVYRTREVLRLSAAEAE
45 RLYGETLPGDAQRGRTAELILTVREPVGVLSITPYNFLLLPTHKLGPALAARCSVV
HKPATVTPSSLRLAEILLDAGVEPLALQVVVGPAELGEELARADFDALSFTGSRS
VGEHLREISPIPRITLGGNDPVIVDETADVEAAAEAAVRGACYHAGQVCIAVERAI
VVEDVYEEFLEAAVEVAESLKVGDPLDETDVGPLIDDGAVEKVRRHVEDAVERGA
EILTGGEGEGRFPPTVLADVPEDALVAREETFGPVLPIRAKDFEEAIRANSTDYD
50 LHAAVFTERLDRAVKATRKLEAGGVIVNESTIYRADYMPFGGVKASGVGREGVPQA
VREFTEEKT VVIGRR

- <SEQ ID No.:1109;PRT;Methanopyrus kandleri>
LSGTETVRLRAVSPVTSRTGESVVDLREDLRRHLRALLGRCLERGEVRRRIETALFG
GTVNGETIFPAVEFRLVGDELPRYPAGSVFELEVRVESRELPWSILSRYSDDPVEFA
SECLGWALELLSLLGGVGAQSDLCAGSLLWEGREPRRPVDVLSRTDAALRWVEAK
5 FGDVPDRSPRFAAFRDGYFLVAVGPTGDLYEVLGRVESVYNRLARARFRLVLQVK
RTRDGLHFPVAVAFARHARERVELQRAAATFLDLGWETLPKLLDLAAESGRRSRPI
RF
- <SEQ ID No.:1110;PRT;Methanopyrus kandleri>
10 MELAEAEKVAGERPELAGWAFRILVEARDRRQWGIAEVAFRNALGEVVRLRDLKN
KPPTTWAKKWCKHGVFRGMPEVIARGEFRFVEQLPDDWLTPGERARRQLLQG
HFRKSAGRARYAIRIGGIMYVPTLVGPIATYGLAYYLVRSVPDHLLAGARTPMKLVEV
AEENELAITSKDIERAGLKPEARTFRNLRYVTCKVRIFFPTEECKLAGRFDVGLLELV
TRYRKGIMETFTG
- <SEQ ID No.:1111;PRT;Methanopyrus kandleri>
15 MLLFSTAIPAEVKRGLGEAGLRFGTVFEVVGGLVLPYIAEFSEEYHVVEGLARIDKEK
VRSQGAVTPALGIPRKKVRNYPLELAQVTLKVRDVLTYKAAAAYFAWIAREFDVSV
SAVRAILEDSEFLEALVEILCPVNPKAAEVLGFRGRMWRDEARWLKFEEMARKAL
20 ELAEELGDNRLRTAAELILRGKSSGPTVPGARGDHDGVVYVDIGKVRNFLVERMLK
YGESSRKQPDEEIIIEALVTEYGVDFEDVHYAIAVLSEGRIPAGPLRTDARVLLDNVAG
FPGKVERDVPAPWMRKSYGAWFSDLRRLVPVTEENFNDVMRAKGYGISLEDVEED
SEWYLGKTVGKVLLGEDAKVPPEAREITQTENVKFNAAALRPRHALSREEVEEIREV
LGSVETDVPVPIEGIVVEKALTEFGKLMPEDISAAISRGD
- <SEQ ID No.:1112;PRT;Methanopyrus kandleri>
25 VLLSLVLIGILPLPPSASAATVYVHVVPYLDSDAWSQDHVAALKEFLSWCEERGIKVA
VFHYNVCEETAPGITDLIREYAERGTISLVGLHSTSHALGGLPLSLQYWELEFNLQFL
RDRVGSNVAQVLSVPSWVFDANTLYACDKLGVRVIVCGTDITAINPDYDPTWDRLD
30 PIARHMLVG YFNVRGDRLYYIPALS YVSDLVQAAEDRGTTVRELLQNAVRNLIDSGV
INVTGDVHLAPWVLIHPWELADADV RQEFENFLSEVGN GSFD FEYQGVTVTFELSD
PREVVNMISSGGTNLGLVALPEPDYSSILHAADYHHWWELIDLYPDKSKIVREWLDT
MSRWRALDSALWDLTVNGVIDDSIRKDL YRAVERVWNEALLENVLEYWDPSSARW
35 SLLEERKALSTVYREILT LHAELVGSMVQQSRVESLEREINRLEQGLEDLSRRQQDL
ERRLESLEREFQGLKKQKSKRGLPVLPAPLWWKRRNPFGRRHRC SREGPSHPFC
R
- <SEQ ID No.:1113;PRT;Methanopyrus kandleri>
40 LHELLTFLTLVSPVAGLVDGGS MYLTPDVHTVVG TQWDVTRVLTTPELDEGAVF
VREGDRWRETMEETSTRFGSLRRLDDVRVRWSGGLLHVQCPKSAEVLLLVPDPE
GIPVTEGSTFLEGGPLPEGAHVLLGGCVIRIRYRGPVVLEIPFETARESIVSVRWIEG
TTYEYTDWAAHDWDRRFRPAFLPALVSCVRRCG
- <SEQ ID No.:1114;PRT;Methanopyrus kandleri>
45 MRVLVMAIVAVAMVANSASAITGKATTNGATPEEMLENLRVHVVAEEGATLDLKEH
PVVVGEHAVYVVMITEGDAKSSGETYEEQPLLVP LPKDGV RVEGDTLTVTRPVDTI
GYCLSPGS AVPGWNGPESLVVPTW EGLSSKLAI AVKPKDIEQVLATGVCEPEWVKY
VRITPTTVRRAVRILDSNVEWTRYFSWDAQLKIWDALWPTESGSSLT ELLPKLLPTA
50 VLALPLIAYLTQYL TSHAEGTFSPGPTGSTVQSVNPGSPQETSEAQRETQQEVIES
PSGGEETPTITITESTPSETIEAHFAAVKGGPTTRVSAGSSVGGATGRPVRTGTSG
VCVGEHSTGTPPLLPI LAVLAATTG LLLCRKGLSP

- <SEQ ID No.:1115;PRT;Methanopyrus kandleri>
VITLYDQSGEIVSQETIEDPPETGSVRFKVTGSGSYRAVLVLQCSSGLTTESVASELS
TDVMEIVLPSVRIRASTDVQPGEGATLRVDYDVDASHAEVDGVEVLYDEDGYVV
GKKEVSDLSGSVTFDVKDGT YKVLITARCRDADTGTQFSTTTETGVTVQIPRASVN
5 GALSLVKKTPKNAVLSAYYEINTTACTPELLEIALYDENGNLMDRKVVNNPPKTGSV
TFTVTRSGSYAVMTLQCSIDSVTESVSKLTDDAVAVVLPVSRVDVDARPTPESAT
LSVEYRVNVDRAEVDSEIFLCDESGNVVGRKTLADPSGSVTFEVGREGTYRVLV
VHCRDADTGT SFSATAGTDVTVKLPRYQPHSPQSSAEGRTEGEFHTQSGARSATE
EQRGQTIRSANRLQEQREGRPPTTQPTTESSSSDRVFPPEKLQGRAEENVVEEKGS
10 GGRTGGRSEERERLEETQSALQGRPTSAEMEARIATVELTTAGRSFLIDVFEDGT
LRVTTEDGTVRTVKLPLNVKSVNRVTPTTLEVTLQNGRKVYLTVDERGRLFPKKFVI
LGGAEKPHLREGTGHAPILPVIPIVRRRRR
- <SEQ ID No.:1116;PRT;Methanopyrus kandleri>
15 VYNDSDAYSEDQVKAYEDFLTWCENGVKVAVFHYPECEFEAPGITAVIREHLGKS
VEFVGSHGTAHSIAGLPPEIERLQIEYSWEFFKEQNLEPGLRKDVVSPSIEWVIDENF
VHVCRELGIKWIVSGYRTWEFNPEKVSWQGEDMDYLADVLIVKKLDIDGDVYVC
PVIDFGELVDDVEQDIGPYGLES LKGAFFRAVETLLNVGAIKGNNDGKADLVLVVLI
HPWQLVEEMGSTGRTGLDLIEEFIRWVKSGSLDFTLYGVIPVHFELERPSECLELVR
20 EIAENPDAYGHPDVTISDL DWTSMVHASDLRTVEELEKKYPEIVKLWREGMDVLKSI
APRLQRLKRTELDPLVRDVLRVTNEAQLSCMCESEGIIQYLEVWKAELELLRDYLD
GSASLLTTSADDNHRVLV FQYSDGGIAAVFLDRNWWCPSPGVVRGKVTLDRADPT
DLVVRGEFTSVGLSDITGGRIVVEDENGDVIAEVPFTLDELASGVTISLPKDRRADTV
YVVLSGNVQGRLLWDQFQIDLSPIRYRERVSAARYP
25
- <SEQ ID No.:1117;PRT;Methanopyrus kandleri>
MAGLPPWMAGALYGLIEAIGWDEL RPEALHDLMWRLTFHTVTASAPTIPAVLYHALV
NGSPYKWTTTAGLLVDLLTYSLSAFFGLRS
- <SEQ ID No.:1118;PRT;Methanopyrus kandleri>
30 VCSCTHRAVLIEYREHV VSVTGGRIAVSLPDGSTVEVPADSCLELGSPDMAAYR
VGNRHVYGFPIAVTYRGRIYLLGSFRLTMGDAPIVERYAMRVLNRNGVEFDVGYSEIT
VYEPRTL PVDRLAPFIRAAYSVRCTSAELRDGVLGLTLEVTEARTVEVSQGKS RAP
VERYLLLCDLRAGTCRLAGPVGGSPTDDDHGIVCAYDLNSGELTFTIVGDSLPRLPP
35 LLEELGADPAVITSLKLVGKVLSGDYWATSWDYWNLVKRASDPVRHILERSGIVAA
VPMRVVLHPELLLGGYLLAAGTIAGTSLGLVWLVPDICRDAGPPRHFPGACFESS
TGCSCCTG
- <SEQ ID No.:1119;PRT;Methanopyrus kandleri>
40 VPIPIVLALLIMIGPASGAIVEFSEEP ELVGKLISR VHDLRATEGAVRELNAAFAPGE
VASVSGVFVYPPGSPDRVP
- <SEQ ID No.:1120;PRT;Methanopyrus kandleri>
45 VFRLGTTPRATTYDPDARIGEVASRFGLPTRVLIEIVRTESFQ RSLRRVTSGKPVVLD
LRELDSDLASWIATHARLVEPALRELVRTVAPDVEPRVRFRGLPHRFRRVERIRPM
DGALISIEGVVREVRGAERLEHAIVDTGSELVAVRLHGHRLGPGLRVEILGIVRSATL
DALEVHKKDPIPEVHPDPAELEE FRELADKDPLTTFARAIAPLPGAEEVGKMLALQLF
SCVGKNSERLHVLLAGYPVVCSEILHHVLDHLAPRGVYVDLRRTELTDLTAVLKEDR
GWALRGA AAVLADGGILAVDHLEGAPEPHRWALMEAMDKGT VTDGIALNARCAV
50 LAAINPGEQWPSDPPIARIDLQDQDFLSHFDLIAFLGVDPRPGEPEEQDTEVPSYTL LR
RYLLYAIREHPKPEL TEEARKRLEHWYETRREEVEERLGMGLPTLPVTRRQLESVE
RLAKAHARMRLSDDVEPEDVDIAAELVDWYLETAMQIPGGDEIRISS LKP

- <SEQ ID No.:1121;PRT;Methanopyrus kandleri>
 LRLNAFVVYARPKGPSLTVDSGVLERLGAGCREVEVGSRLDLPLKLVEDGLVEPGR
 VTIYVPTTWGSRAPARALSVKRMETVGYEVHVLVGTEGGSGRLPEGFPGEVRVE
 5 NVKRDLSGILKLSDDIFGLFWSEGSLLLDLWARDPGPRSDLAILTVSTLVALKVVEN
 TSGERPLERTVMMMEVDRRLVDASELLHALMVALDLAYFPIAPDLGRTVREGIEELL
 EGLEGSEEREELRKAADAFERLSGSVLDAFELGRVEIPDRPGILRELLEYRLRGLSPA
 MIDGEFPRRAKRMLKKVRRRLKRGDGRPDDTSSERPKRPKI
- 10 <SEQ ID No.:1122;PRT;Methanopyrus kandleri>
 LEVHYELPLGGAHLAYRAAEAGHDVVLCDPSFDISEESMERLESAGVELVTDDTAG
 VEHGEIQILFTPFGHTVKIARELLDDVREGAVLCTTCTCPPIALYHGLEGELRTKRED
 VGVSSFHPAGIPGAETQDLILVADARSEESGIELASEEQVERCVNLAEDMGYDVYVL
 DPELISSIGDMSVVLTVRIVQAICNYFSVARICGAPIEMIEEQVEEVLTSMAYLVGRYG
 15 LDAFDRMDGKLLLRSLRNMALTEDVERVVDFFERCYVDLLSGDRESMRELSSMMV
 PPKLVDREVREIVGEAPVQYARRRFFEEERWGS
- 20 <SEQ ID No.:1123;PRT;Methanopyrus kandleri>
 VSSETSELDEYRETFRELYYEEALKGFRAHLTIYLGCVAMVVMNLTTPRVIWVIWP
 VLGWGAGVYCHYLGVRRAERNIRRLLEEALRRVQGP
- 25 <SEQ ID No.:1124;PRT;Methanopyrus kandleri>
 LRMIAYDLGWFSRALLADATVAVIGLTIVATLIAYLGLGGPLRPSLAVGAAAGALGLVI
 YWYGTLLASSCRIRGVGRTDWGVVGVKCRSSVAVVGILGEIGEIGVERGRIVKRE
 TQYGLCLYKLVLPREGELLWYVGQPEGLVATVGNVAVFSDDLPRVLYLGVIATG
 SLEWFLDVMPFSTLADLAMEPAWRIVRESSSISCAPSWDRLAREVAVDPGMTAR
 ALEGRVALVHRDVALFFLSVLIVVLGVPVALSVLSGYGPVLYELIEPLVAVLQGVCGG
 TFPVLICTLLAALLVGAVLLLTSPLLTYVGFVTRLTADRHA
- 30 <SEQ ID No.:1125;PRT;Methanopyrus kandleri>
 VSVGPAHSFEPVHTEPPGECTSLKPLLTIFLAFTVIDHGVPLATYWQDVNLRVILEKR
 PRTLWVDPYCGPGDRPWTEDELRTLREHGVKPVAYLSLATVGEHQRDLYRLTRSK
 RLLGRPDPPEWPGDHAVRFRERAWLDALRAKLKELRDLGYEGVFIDVDPWSRDW
 YVEWFHRETGGDVDELKGRSYRALEELLRTARDLGLRVYNAGDAVFDRRLAELK
 35 DRYGFGVVVENVVADEEGRPTPGNVFEAKLRALERLGDWVYVFEYGIDPERERNR
 LTELFSRTDVEEVYITSPDHDRLGKAAPPTALLKRPGSTMGRLKLLVA
- 40 <SEQ ID No.:1126;PRT;Methanopyrus kandleri>
 LIVVGAGTFGCRVAPYVASAFEASSVVLVDTDPDGIQSGEELAKKLGLQTSRVEVAYG
 SPSGAHRDYETAMKDAEKSEALKQLSEKFVEVVKLEYRADRVPLVWGLGGAIGA
 ATAIRLGEEVPYALHVTVLPDYRSEVEPVRRLLFNAKKQLQSFMGRLKRHPVIIIGDF
 AGVPADKVGEHLVCILSRHEIVDKRRVQTANYVRDGDDEIRMAFLVDVNRYGLQR
 VQLDRIISQIQEMLEWAEDFVECDLAGRIRAARLEESLRTGIWDNDWKEAS
- 45 <SEQ ID No.:1127;PRT;Methanopyrus kandleri>
 LFIGVLLAPTVNLLLLISLVKLLHVKCSLQGAELIARIAPMMTLGVVPAVTVEARSLLTR
 IPPTATVERILTVLNVPVAVFVYAFSFFILVHCYLS
- 50 <SEQ ID No.:1128;PRT;Methanopyrus kandleri>
 VRPLIAHVVGIACAVSLTSVLPILPLYVVDAGYPRSFVGMNVLVHNVTQLLARPVGG
 ALTDAYGPRRLAPLGAALGYALSDDLVLVPHPGTLLASRVSLGLGMGALWPPLLSTVA
 DSGRSLGVFNAVTVLPMVLAPPLGGYLYRSVGPWAFVAVLALPALLAVPLAGSLPDV

RTSREKVSPLEVLKRSLEVDRELFRAFLPAFATAAVQPTIESFVPLLLKKLGADPAQI
GLVLAI RNAVAVTLQAPCGWLADRYSP TVLAALGCVLAALGVLVLPFVESVPVAVVL
LCVGGVGYS LAQPSS LKLVAEVSGERRGLGMGWGWSIMSLGRLTGSLPGLLADVS
LSAVFYISGAIPLASVLP LLRRPR

5

<SEQ ID No.:1129;PRT;Methanopyrus kandleri>
LRLPAIAAGLLILFAQPASCLKVAVFAADDVEPTCLKAIEKVLRDAGVPFDEVKGKDIV
DGTIVERYDVLILPGGAYSERVVHHPRFIEGLKEFARAGGKIVGICAGAITLVKGGLV
RAKVEGAGLGVGKVTLELERDPLTEGLPDRLEV TYINGPVMRSQGAKVVARYAGGI
VSRGDAILVD RYGKGEVIAIGPHPC HDERGNVNTQGA KLLLNALGVKKRVKSGKVE
GEGWFPTPVPVAAVILGLVAALGVRGLISRRGTGVK

10

<SEQ ID No.:1130;PRT;Methanopyrus kandleri>
MTARRFRPGTPVLLPVIRFFGRVIVTPFCFTVGREPVPCR VVSYSYGRGAGPVDFRE
LKVESVNFMCPVSLPLAVGFGVRVLGERSVYRRSGRHS

15

<SEQ ID No.:1131;PRT;Methanopyrus kandleri>
VSDAHELALRRRLKVDLSLLKRLGLEGSVVRNVRHPLGLLVKLAEEELVEPGRVHA
HLPLYTPPISTVLRLL EASEEVGYEVTASVEVIAEDDGRVEEVREVVD RVEPVILGLP
GVLTLSDRVFELASERAPLFLDLGWALHPHRAVPSVDLTTVPTLAALRAVESVSGED
AFERVVAVARLGHGLTVDRGKVRGSGGGGLKLV DVTDLRALS VVLDLARYPVAP
ALGPTVRRELERLLD GFDGPEREDLTEAARAFELL SNLTPGQTEEDVKIPEHPSIIRE
VLEDRLDLVE

20

<SEQ ID No.:1132;PRT;Methanopyrus kandleri>
MDVDTEELVRMAEWKLSEAERALEEGPESPAVAE AHQAVELLVKAALRELDVEPP
RTHDIRLLGVLTT ELLDLGEGDLAVEVRRIAREHRDTLASLLEGYFSLFEP PFEGDA
EEVVRAAGKVFEDLRRILEKVR

25

<SEQ ID No.:1133;PRT;Methanopyrus kandleri>
VDTSGHRWVLVKV KYFPAWHARGGRILMGP GGT MIVRTGSGRMILYFAYPIRLHAL
GALALALQWINAPVRAMMEG

30

<SEQ ID No.:1134;PRT;Methanopyrus kandleri>
LPEYPKPGTVREAVYVLSVPGDRATLDLVFDP PPWARVLDLYLSAGSRVLGAGMVP
RSAYSGLDHYVPAP ELPGFVRLELAGERTERWSSDRFPATDPWLRGLLKRHGLRW
TVVRYFLPRNGLFWARCEVPLLDGFV VWPAPFVG GYYVYGGVTEARLVPEGGPDR
RLTFGPLPPLSDLDATLVLVLDGPPAVVSSRG FHRTVLVFRPVGASPEAYRYAAD
PLRVALGLLGGAVSLLVRPTVPKALAALLVLPVAGLDYRWPWLTGWATLGPVLF
LCLLHVL

40

<SEQ ID No.:1135;PRT;Methanopyrus kandleri>
LPGRVPKDVWLLGAVSLLNDVSSEGI FALLPYYLTALGGGPALVGGTWGGMELVKS
LLNVVSGRVFGRPGWAKPAVAAGYGFSA CMKLLLALVRDPVTAGLVASLERVKGKI
RTPPRDAI LAGLAGSEPGLVFGVHRALDTSGAVLGALLAGVLLTYGVPAATAVL AFA
LVGFLSLVPLIPVEERLEEGSSEGEGRGRFPRALAIVGLYRLGAVGWM MYSLRVLG
VQGPAAAAFAYAGFSTLHALTSVPAGRLSDRFGPGVALCLGYAMTAATALLAGSGL
AVAAFMLYGLAYGVDAVERAAVAELSGTAASYGAYHALVGVGSLVCGLLVVGWLW
ESVSPWAAFGYSACLTGVAAALAPVLILRRGSGG

50

<SEQ ID No.:1136;PRT;Methanopyrus kandleri>

VPELVESHVHVPIPSDPVERIRALRVLREVVYRRGKKPSLEVITYRTVGGSTCGPYYVA
RWRKDSRFKHGRTLYLDKSENEVSFVFWLVSLDRSEVLELARHLMRNLRSLVKT
LTEVLSLPYKKARRVLTRGLALAFDARPSNSPRIRDLEELPDRLESFAVRTLGWP
AHYSSYLKRVIRSRRSLDGRHEVPDVELELERWKLRHG

5

<SEQ ID No.:1137;PRT;Methanopyrus kandleri>
VSGRDLYVLEARINRRNYREFVSRWREWGERIARVARRLGEGTRVFVFGSAVKG
EALPGSDLDVLIVSDGVPEDLEDRVDLIREFERELDLPERHPHIEFHLATPEEYEEVWR
VLLDEYEEF

10

<SEQ ID No.:1138;PRT;Methanopyrus kandleri>
MRRLRKLLERAEGSLEAARWLLGRGNTDLALVMAERAAGLRIRAAQILLAGEHAR
GHDLRDLRGRAHRRVRV

15

<SEQ ID No.:1139;PRT;Methanopyrus kandleri>
VCEHAKALDVLGVAYTECRYGAWEPSEETLEWAIGTVEELFELLERVERDHGPASR
P

20

<SEQ ID No.:1140;PRT;Methanopyrus kandleri>
VIPAVGTGVGAATVLGSLPPYCGWLAPAAMLTGFLLTLKYERWVRDHRIVTVWGR
VWETVRYYPWPSRSTRSAPGGGP

25

<SEQ ID No.:1141;PRT;Methanopyrus kandleri>
VVAILAPQLVVTGTAYGLFILHIAWERRRKRAMDVLGRGVEEKKPRSWEPEEF
KNSRCDPVTRLVFRPDLINCAPSGYLLVSTMGWVALAFTYEMSVLLGGHSPPSVR
FELVSTFAGLLVFSYRSDVATLLPGFRSPRSRGS

30

<SEQ ID No.:1142;PRT;Methanopyrus kandleri>
MRTFQFHPVTTAVLRTPELDEGALFRLRDDRWVEVASGDLPGTFFRRLGEAR
SEWREGVLRVEGPPGAEVLLVPDPEGFPVTEDESTFLEDGPLPEGAHVLLGERVR
AFRTHVPWRVRLPFEVARESLSVSRWVEGSTYYEHSDWAAHDWDRAAVSHPARP
RPELRV

35

<SEQ ID No.:1143;PRT;Methanopyrus kandleri>
VSTDDGWIVRVSSFKYHRVGIVTFGGHVEVDAWRVHTFLRDEELAERLADVLPGR
GELLACEGLLSSYHEVFVRPRGDEIRIKPSGAHTIVLVSRGFVLTRKPERVRELRA
RAVLAVAGLMEGKVSVPKRWIKAFVLGSRGRLAGIEVKSLAYLGFEAIDGIPPIVGPS
TSLGLIVLSIDAWDEVCEKLGVGWELEVDIKTVLLILTISYFVAVGACIVRTLGGREPK
ELHYARMWEELEGDSNGVGEATIADTRKEEDSEEDVEYDEPGKWIRKRRFKSLP
DYEYIAGIRRRNGERSRTS

40

<SEQ ID No.:1144;PRT;Methanopyrus kandleri>
LALEPGQIIAFITLFSILFSIIVITPPLLVLARGLARREARCRRETLDHVLRSYPILIPP
GLSMVSSYIVFLISILVECGVCIVTKEKHLHFLRLTAILIIVTITASLSLWLAAMTPYITIAK
VLPSNHKIRIKLFTITYQPILIASFSENIHTNNIQLELKTRGSELIKYSISKRTERLLRTL
STLDGVERVNFYLGVLKPGSSIIIEVKHNPENGNIVSVITPGITLTTSQSNTNLDKVYNF
DALATVTLPLLLGRNSYTLRLDIEEKTNVSLDRISLLEWLVFAVVGSKGVSLESSH
RIVKSNGLMLLSSLHPAFTPIIVYVLSLVIVYIICTILKASSDPLHAILFYVIVPQLASVA
VSTGISLVISPITSKRKVDLLTEVMYLYKARRG

50

<SEQ ID No.:1145;PRT;Methanopyrus kandleri>

LIEVLTVLLAHDPTLMDPCTHGLEVVVTGVRGAGRVGGGREETGGVGKGVGGGGR
GGKVGGGGKTVHPSELLTKPKWRFLRET LGGVKARRAHAFRWLTRYHPLRSY
YLSSLATAFTGLCVGLLAVPLATRARRWRPETVAFAAIALIVTVSTLCWEAFLGYLAS
CQFLARVTEGDAHLALSEFRTWGITGVGYLLAVYAVLASLLACAAWRKLGGRASLR
5 LAPLLVLPFLTGLWFIRLGLAVA

<SEQ ID No.:1146;PRT;Methanopyrus kandleri>
LMLCLTVSSALPAALT LGFIGFPRMRGDRRRLSIALLSLGYCEAELITDGEVEVSRFR
ELSSYPVRYGEAPGGQPSNLRIRVGYFRPGPCKVEVRDCGFLFLRTRGVCVLHDA
10 QGLLKDREKAFHLLRWWEKFSMVYAALCLEKEESPEPEEVDGLLGSVNNRAGW
NELVYLNRRFSLTDVLRHYEVAVSMLGTGVCCLVTPAWVKLIGVKPSLKLHTWWY
LAPAILIPPVSALGVFVINLDTALRSWRLVREGRVYESVLGRDPYDGKWKWLSR
DGDPIASRHRESESEDEPQSG

15 <SEQ ID No.:1147;PRT;Methanopyrus kandleri>
VRAWLLRVQAPPQGRIEKLVLDRPPRARVWLLGLTYRVGREYHALLEPGKSELLC
ELKVRVKLDDQAI DLTEPSLLLIHTTRGDLEYSVIDLRNPVLPPEWKRAAPPVNEITVEY
GPKALRTIKLESEFYLVVLCLPPGFEYSPEDFTKWAQALAGLKDEVK

20 <SEQ ID No.:1148;PRT;Methanopyrus kandleri>
LRVASVIIWLLWISPPASGYVCWSVPVGESVTSVESCDAAVLVTSSNRVLVAELDA
SSVRLSEVLNFHLP SGTKVVSVMRSGLGLVFDAGRILDDGIEVYRGVLTHGDRGWR
GELVRTVAKFEEISQRVKSGEWRVLEVSNLASDRTGGLYAAALLESVDGLIVEVW
NLPERSVIADFSATEVRRLAIGDEGTLLVACGDGVAVVDGRNVRFVTVPGVVIDMV
25 GRWVLYEDWLGYALGEVTTSGLRELVR LPGPAHRVTWSTGGDAYILAYGGINIV
VDPEDRTVVTVLDLPGRVEFLAPPFVYSGKIGVLYLAKIMVQLEEGLCPAVKTW F
VWLDWCAVYIVDRKVPAIYKVVEVRDKLGNWIKTRSGGVTFWYKRVFLKRWPR
HPTHELHDDIGIVIGERN SKIRVYCLDERTEEV LKNLLRSPDVCILNVYPGSAVFIV
DFKWRDQRIPAFRFVRKSGWLVTGFIDEDDVCPSNDYDDVLSVPISPLTAAHSGM
30 PVIPLLYGKDWWLLSALLPNFDWCWDKTS ELKFVNGKESEFYVDW SNKTIRGPF
TKLKLKIGKDKQLFILLRGLSEPE SIRIVLKRPLGPVYEGYTEYAPPKVSISRPSARLV
EYNAKEDKVTVAVSAEVSVRNTVIRRLTIEVFDLFGRTLTRKVMGPLPPGKHIEKRL
SFMPPHEHGPLKIILLAEYDGD LVIVSDREFVLRAEPERAELTVSYERPGRLTARVLDY
GRDWVELRVESEEPGNLHLED SKGRPVYVLEGNELSGPYDGEHPLELGTTPVIL
35 ILRDLKPGEAYRFKLIREGRIPTAFELECALPEANLDVELLSGTLEGRSLTLKFSVRGS
TVNSTFKRLNLVLREDDRILWREEVDLDNTTWFDLPFETTVEVGGDEGTLTLEVTAH
YDHDTVLPEGNEFEVREAPARRVLRIAYGRPHVELEDYGLNWLLL RILPWRPGDLL
VRVNGKPVITYYVKHGNEFEKHSEDDPYHASGANAVEVLLYDLEKHGTITVINRSSTL
SSASTLDYALPEGVELAAEVVGGRYLVDEGR LTLNVRTLVSPIDVTVRRIARVDDL
40 GEILGETVKTVELGPGIHELTLPIEVRVHRECGRRLRLQALAEFDHGTIVRDPGEGPVP
NPASRTIEFSYSAPSVRVVD RGIDWVLEVT TREGGELVHVNGRKAWYYLKR SRG
GDWEGPYDPTSVGPNRTVLVLVPGVPPEGRISVVLGGRLERVRSVEYALPSVIARV
DVEDVSVSGEKVIAMISLWLEVLGTTVRSIGVSVDGVKSWSVSALEDGEPLRLDDLE
LGEGVHLVRLSIKFPKERAGTVPVTLRVQYEGDSTFDPGRREFVESPLVLT LNVPY
45 VLPQRQTSKESGPRGGSPKVP ERGGTA VDRGSTTAGESGTGRSAVTEPTHASTR
VERRPSNEERPHVVRPTPPTRFPIRPVRTETGHEVKPKPLEKLPEALPHPSSSLPDT
LEARLTPVLVSLFDRLWDL LTSLLSQPTITGHAEGEPTAKVTRRPIEHAPSEPSRPRT
PTGSAALQGPPHGTTPVQGYHRVGALSAHAPHTFREVEILKTRTRGYAYAEGTSRV
50 SRSLTRLPTGVNLLALLLSVFGALTGLYLTHRSVRGGEGGE

<SEQ ID No.:1149;PRT;Methanopyrus kandleri>

VSRLLPVVLFLALVSVVPVGVQAQSFKWVEVEPSVHTFLGASVYLVDNEHKALYS
LGEYSTVMEKSKQQTQPRPLYPKDRSEPLGELDLDALGVAVSCWFGGVCSSDR
TMRTLLQVLEMDDEVRARVLGNVCPTLTMFGNVPVHVTECRVERTENTLTFKFTHY
GITVRIVKSELKVQVTDYGRDWLLLHVEPPSSGKLSIEENGETLAFHTLTSDGTLSGP
5 YTVLEVEEGRPLDLVVKDLEPGEKSALDVLEDDLGITVRKRVEYALPLVNIESLTV
PGNPLRVKLRLSVKNTMVKRITVRVVDCTTGGVLTERAFDVGLSEGEHELEYSIETP
NTTDPLAVFAAIEYDHGTTLEGEKFEPVETPAQDFTTIVPSTGTPEVMLDVETPERA
HLGLPVENTVHVRLGRIPLSTGEIRVTTEDGKTLARTTVSNGEARMILPHTHTGDVEL
HIEYYLGSRKLAERELTLHVSNEFHGFTADIVSPGNLGSGLGYDLRGSYIPERKYP
10 DEPMLYIYRTWWDEYYPFLVQPADRPNALLANGLKITLPEPADTVYMLTLPVRVHYP
IRVTIEDSSGERVTRKLWWLNWDWQWWWDHGWVSVYHLRLTARDLGLKDITELEF
DVPNGLLWILALTYRSGDAYKALIEPGKGVTLTYREPGPVEIELEGWPAGSDHEVWW
RKVGDEWIPFYLCPKDHNPALPADHLLLHIPHDADRAYILLYAREDTTAEYGILT
TVPLELPWKSNVPRSDDFDHLAVLEIPCKPSSLARSRGRVLLVNAPNAYVIAITYHLG
15 DKYEAHAPDGEKITLTSKDLPHYHNANILRETIDSEEHLPELWHEGVAYHWLPVP
GTVLHVQIPFYLAPKDAENAIKVENDLKIQLPEGTKAVYLLYIATDQRPDKDRPASKY
HLEITLDDGRTVQAIVLLPDYALTRDPSTALLAMDYARTNPTGLILITQRPAAWHLPLV
LKDDQPEEAHAYAWVLTATGEEHTIRELTLPHPETGRLLYLLAITAQAKDARLYAVLG
PGQWVELSPPGEVWHGHTVDVHPGETREQLPIEAWHRRVLVKTPEAIPLLAR
20 PDGPNATPIATRESTLNIILPKPADAVYLLYLATDYEEASTPPTPLLLALLDDGKLTGT
LVRIAPADRKPSDLLPALAWAEPLVEEGEDLTVRQAPVITWDRVYKPTGTVVLEGRT
AWLLELKPEHGRIKALTFLPTDTRLTVYLLAVTLRIGDYYYALEGGKTIRPLDAGEAD
TTIETAWKPERAPELPRTFSWPGFSVDPAEKPYDYRHHVRVLEDEVVITLGDEPVP
VRLTGRLAPVVRREVELPEPADAVYLLYLTGHAPSTSPARLLVEYEDGGRALVLVNL
25 ASEVGLYESPARTVSAWVRPVLGWHNGAPTVVQQPALELERDDGKRVRAWFLKV
QAPPQQRIKKLVLLDRPPRARAWLLGLTYRVGSEYYALLEPGKGELDELKVRVKL
GDQAIDLTEPSLLIHTTREDLEYSIIDLRNPVLPPEWKRAPVSEVTVEYGPRIILRTV
KLEGESYLAVLCLPPGFEYSPEDFTKWAQALAEKDRVKQDEKDEKLALVLTSSLP
ILEAYYYDQVISKLCEYKASWVRILPGVIIAQVTIEKRSDNKVRLGLSLDTPTVLLGV
30 EFYADPVTQRALNTRASILTQVIENYVVSKITGEPIYSEEWALLPDNVRQDLEKILK
ELGVEPHGETNKQSSIQELIEGEIPEYNPTTGTIEIEVEKKKGAVGVALWLSTWLSLI
DVASSPPHEWWEWFLGLSMGVIGWLGTIIGFAIISIGISIFIWYREYREYGSTPSPF
GWASLAISIGSTIKDIMKML

35 <SEQ ID No.:1150;PRT;Methanopyrus kandleri>
MIYYNDATGSALGGVLM SVRTVSLTLLLIAPVAADIPPHASEKELEDPNWWWWEHH
RGPVWATRYPEVWNKIVLKYEDPEDREKVSKLGEALRHPPRGFELWIWFI
LPPASRVGFLKFFKYKTWEAPEWLIQYCGTIILSMAYLAIAMGRAYVLNCSV
GKLSEAYRTFYLTAYAEFPFLAFNAIPLILVSKLELPYRRLKAGILIAWLASL
40 HMHSESLTLLSTLGG

<SEQ ID No.:1151;PRT;Methanopyrus kandleri>
LGHSVVLALSIIFFVALCPCHAGSWSVDPEIVEHPWLWNRYVVS
GLREELLDYRKARVTVFLCTGVWVIGIALLLVKNRRAPKEALTEHFFRLASPLGFA
45 GLAIVIASIGEFNALLALSKEGYRVAETIRAYGVYGPVIALIAVILVTVSRRAPK
VDLPFLPKTGLPLSRVSAIIAWTSVLLTSALIISYTVELFSR

<SEQ ID No.:1152;PRT;Methanopyrus kandleri>
VIVVITA AISLQPKASHATLAATEFLILILALS AVNYVLLPLLGF
SLGYCEGETILEPGVEVELSGFQVLAEFPLESEYHGRLWIRIGYFPPGIHWV
50 GFFFLRTRGVLCALRDPYLP RDDEGALEMARFLEKLSMVYA
KIMKHVKNNSRWGTTVRYFGVKVPLGRFTTSQSTTVTVAVLVALS
SLVSALARGEPL

GPMGAPILVLSWLLACVLLALPVAWRNRRRAVKTGRWYRVIFERHRVEEAIDKARDW
NWFPDLERVDPLED

5 <SEQ ID No.:1153;PRT;Methanopyrus kandleri>
LGRVVRGLLMAAYVGLSLAITWPFARFFRWCAPYAPAAYTVSELVMMVGTGILR
SAIPLAAVGWGDVLNVAVVAICASYIPFCVCWVIFRVYLHCCGTALPDGGSMTVLG
AVLLSTTSFQVLWRPEGRGSGCTVRWTSAGT

10 <SEQ ID No.:1154;PRT;Methanopyrus kandleri>
LRGLTRFAERRLRWYRRAYWTLCPAVVLTGLGWEEAGLLLMGFAAFAGAFYGIY
REETEGTFPRSEHSRRVGRITLMWYPTASFDRVLGGLTPTTFLPLFPALLYFITSVAR
HPDFLHSRIAVALFFLGPLPVLLYLVRVEVASALGCVRLRVGRSRALLLSLGYCEAE
LVTGDNVGVSGFRELGSYPVEYGGPGLRIRVGYFPPGKHEVEVRDCDFL
FLRTRGVCMLYDSRGLPEDREGAFHLARWWEKFSMAYAAALCLKEGGPPDPGEAE
15 ALAAGAGDNARRALVTYFVGKFPVGLVASEEAMLGVVLGMIPIATLVRDLLPPDL
SLLSAPIAAPLAGVLLALPIAWRNRRVVRTGRWYRLLLRGDHVEKLLPRLLEDLWS
RRGGMITTLWKVFDVLERERRQHPPY

20 <SEQ ID No.:1155;PRT;Methanopyrus kandleri>
MRTSTPDDRKLDRCTAEVGVLSVLGRIVVSHRLLSLGSDDRDYLRRLCALISDLV
ACVSLGVLFIYAFSLTVSPAAPVAIPAILLAGMTYLLKTLLESSPLAGVDRITYHM
CILSAGTCDPVISMQLQPPGDLMDIPPYAFGLVYGLTVLAPIILLFGTLPAGAVLEPF
EYPLEDSPIPLILVADIVRPFTLCTVILDVLSEVL SAVLLPGEVVRKAVAALGRSVMS
LLGIGPSGEGARAEPAGGSGAPRASLNAHRYSLWNPLQITL

25 <SEQ ID No.:1156;PRT;Methanopyrus kandleri>
VGCLPTVLAALAAIFVGGVATATDDTYPHHYVKFRIEPIQSVSEVPSEVVAEGGTA
EVPVKVTVTWTGNYPCTIKRTPTRMTFAVDGNVNTQMITPPYKVGDTRTVSTTLR
LTPGEHEITVTVRFPNLCSTGSPVEPTRRASGSS

30 <SEQ ID No.:1157;PRT;Methanopyrus kandleri>
LVTSHVPIPHDPVERIRALRVLREVYRRRKPSLEVITYRTVNGSTCGPYVARWRR
DSKFEHGRTLYLGKPENESVSFVEWLVS LDREEVLELARHLMRNLRSVLKTLLTEV
SDLPYKRARRVLARGLALTFDARPSDSPRIRDVLEKLPDRLESFLIRALGSWPAHYS
35 SHLRKVIRSRRESLDGKHEIPDVEFELERWKLRHGRRE

<SEQ ID No.:1158;PRT;Methanopyrus kandleri>
LGDPGASGCCELPLVSRETVSRLRLAYGALCTLSAPLGLLGSDAGVMVAGLGSIVGV
LLGLMRPFSFRERAPKPEHARIGTRLLYPTASFNRLRDGPKLGTALPLAMIPALILFF
40 TMWLSTGDRGTGVALTVFLLISIAATTVFSYLVKLSAAMTLGYALPVRVKPEGTRVSLA
SLGYCEAELVTDGNVGVSGFRELGSYPVEYGGPGLRIRVGYFPPGKHEV
EVRDCDFLFLRTRGVCMLYDSRGLPEDREGAFHLARWWEKFSMAYAAALCLREGV
PGAVELERWLERVRNNRAVGFLVRYMNCDFNLPVVMCMLVLSLLPMTAEVDFVL
TRGVRGWGALDAMVVLDAFTLCLLALPVLGCLLLNRRRAVRSGRVYECLEGEPPHR
45 RLLSTLCVYNPSK

<SEQ ID No.:1159;PRT;Methanopyrus kandleri>
LVCGDPRLREIVLEFRDSVRVGSSRVGGVLRKLYPILSLYVILSLVFEGRGVVRVLW
DRASAPLAMIVIAGACIAPILAAAYLAFHGYLTLEARRRLRAPVTRPHNPTLLLLPFL
50 ALLRPDYVHHWPETRVVALAYLYAGCALSPTLALAVMWVLRTRVWVCWKRDLEDE
VLERFVEGLPDGRYVPGSLIPYASNVGTLAVAIADVAPSLTPYLITAGTSLVALTTYI
STFTEGDLLDILGKLRSRGPWRDDSYVIGFTILILERSFWLIEHSHP

- <SEQ ID No.:1160;PRT;Methanopyrus kandleri>
VGIRGSRGVVSEFEGSLKREPDRWWFTRFLHEHPMLLSTSLALLTLPVLTAGRTV
WELSDRPHDPAALLVTTSATLAPALAVYSALMAYYTLRARYLIRAPVVTYPHHPAYL
5 PLLYWLPSSRLLTHWGEPKVRLGFVVLYTTVLLPTLSLLLTWICRVRLWCWRGDI
DEGTLARLLERLPRDYTYAPGCVFPALVAISALPGAFGYLLKGTWSGWYVLAIPAS
MIVPMTVLTAVIRKMSRSPVEELTDEWLGEKNAPWRDLQALAILATFATWTLVDV
GGMR
- 10 <SEQ ID No.:1161;PRT;Methanopyrus kandleri>
VFSARQLTQPLHVLPSIILMYLPVSIPIHAELTDSSVFLTFLMIVLGVVFWVSISMFLSF
PFAMILRVKDSRWILSWLYCETELITDGSIEVSGFREFTSYPVEYEDLPAGSPRDL
MVLIGYFKPELHRIEIRDCNFFFLRTRSFCLLYDACLPGDREEAFRLARWWERFSMV
YEALFEDEIPDEKNIMKYLDGLYQFKAHHYVPLPRWPYDEDRDARD
- 15 <SEQ ID No.:1162;PRT;Methanopyrus kandleri>
VIPGWYVGAVLVPQLVTVVIAHGFSRKRRWERLLRRASREEVRRSLERTPGGGTV
RLAFVPELLWCVPGRVLVLGSTGWLMLAVLYEFELLGLTRIVPEAKVRGLLAAVLAL
VYGTCAVAVLPGTTPRALPRLLAPAAVGGALGAVAVLKSLLPPWLGLSLAPVAMLVGL
20 SSVIGYRGRLSASGGTAWDEVVEAVRYYPVSALSVGEREAEAAEKALWFLACRV
VEGTRSVG
- <SEQ ID No.:1163;PRT;Methanopyrus kandleri>
LVESHAVPIPSDPVERIRALRVLREVYSRGKRPSLEVITYRTVNGSTCGPYVVARW
25 RRDSRHKCGRTLYLGKPENESVRFVEWLVS LNRAEVLELARHLMRNLRSVLKTLT
EVSSLPYKQARRVLARGLALTFNARPSNSPQIRDLLEELPDRLESFAVRTLGGWPA
HYS AHLNKIIRFRKRS LDGKHEVPDVMLELERWKL RHGT
- <SEQ ID No.:1164;PRT;Methanopyrus kandleri>
30 VPVAYFDGKPAVKIRFARVNAPEIYHPSSEEEYRLGLKAKEFVEKKIRDAGGYVKCR
AYGLGKYHRIIADVYPDDEETTLSELLVERKLAEYRQYPEPDPLPRWFPREFKAHVA
KVVDGDTIYVYARNGEEGPVPFEEKESMRGTVVGEYKTGTPTVPVALAVISAVIGVG
LLVSARR
- 35 <SEQ ID No.:1165;PRT;Methanopyrus kandleri>
LATIRFVVDGIVVEGNGGRLEFDPKTTLMKGDAASLAGFLVWLDGLFEAGVRLVRR
MAEGVEPVVPEGAEPWVEPPLTLPVSGEYSRVELKGLIAGIVESTKDPWTVASRAA
RITEYLSDKGAVRILHGSDPYDVAVGV LALKDGAVRGTLTVRSTVETIAEGARDLI
REDEGRADEVISGIVGNVLLRLGYAVNVRVTDRDGRVHIVRDPSTHADRVAVGVP
40 LTGEVLYGTLVPAAEVGLRCLERRDWVNIIAERIRRLGLRTVSGSQVVTIDGETLR
GDELEESATEILEEGDVERGSRLEPSEPSG
- <SEQ ID No.:1166;PRT;Methanopyrus kandleri>
45 MAAPLKAGVGVS KSSPEEALGAADWGLDRIDAVLCAFSPRHDPHEVREAVEYLE
DDRCLILGLSSAGNITTDGFS DGSVAILAMELSKLVAMGMAIGTGLSEDPYRVARET
VTEAAKSVEVDVSASLAPVATKLV TGNVDVTRHSLVDALLFTDDLCCNLHPEALMEA
LRGVLDCGLTVPRIVGGMTADEYEFERTYIFDDSGVYEDALAVLILYSSVKRGHVD
HGFVLSSEPMIVETEGVDVIRMDGEPALDVYEEVVGEEIGMETLLKYPLGVEDPGP
RPYHLIRTPFEVDEEERTLKLVAQLPSGVAVRVMEPGDVEDSFKRAVQRALEDAGS
50 PDELGAVLVFNCMARHLIVDTDDAVDLLRDLVSEDVPIFGFNCYGEYGLTPSGKFVQ
HNQTVVTVVLGSEVVGR

- 5 <SEQ ID No.:1167;PRT;Methanopyrus kandleri>
 VGARSSSVGSYPTDRDPAVREGAAGDRGGAPGGVRGPESVGRGPDAVWNVSDL
 VVEALWSSGLVYVDVSGARGPEIAGIPLGLAALEVPGLSVGGGREVRFVAGRLEDD
 VLTDTVTEHFGAAGALIWTIICSWKPSPEAARRAIEPAERAGVDVRELDRLGEYVDAL
 DTAQVGEVLAGTRPDRETIRTIVRILRRVLHRVYATDGRFAPPTASPLSGIIRVHSDT
 PTPTTGCAVTSPPREPGT
- 10 <SEQ ID No.:1168;PRT;Methanopyrus kandleri>
 LRVGIAVLAALLATLGAATAAEYPIKGEVTGTFEVHVEADPGTQVDTNEYAVVVGSK
 YVYLIMVEEDDLQDSGKFKTQPFVLPVPADKVEVNGSLVKFPDGLDDTFAAYCLNP
 MGRHPRGEMVVPKWNEIEDRFVEIKVAGHGQVRTEERHLAPEWIKAVCKRVEGV
 VDPGEWKRDQAQTIIWVTEAAVPEENVQVNVENRVQIDVNATVQVNAQDFFQINESEL
 RELANAGDEMARQLLEFFSNKEELENLVNTAQSAALDFVKQHLSDIVTTAQTAKEAYE
 TAKSVFGKIPVSPAVIIVALAALAIFRRRP
- 15 <SEQ ID No.:1169;PRT;Methanopyrus kandleri>
 MTSLESELREALRERRLRKKWAVVAVVYLAWKMYGKHVSAGDIRDVLESVGYEISE
 HAVHAYMSGLRGLIGRRKAGRRTLYTVRNEEEMRRRLRDALRGSVGRISSEEKEAL
 IESILGGDRGRRDPEVENLVLWRRPTAEYRRRIASSVHPGSRLREIPGVFGTFEGI
 20 WGFSGSERVGWESLGEEDVLLFRDEKGEDRYRYCGVIASKCNDPKVSAILWGDD
 RWERLVTLAEVRLVSLPASELNELLGYRAGFRPRGAMRVDPDRVSKLVERYGGVL
 EFLREYEE
- 25 <SEQ ID No.:1170;PRT;Methanopyrus kandleri>
 VTEPLRPPELEDPKRVYVPVAGAGIATVCLYLILPRGLFPALLALAVTAILLGVGTLV
 FRRYLGNQVELTPDAVILKGGGTRIPVEDILDVEERESGVVLT KDLERVPMFPD
 SDRLRHGLRILLAHKKKGSPGDAVVEAVRELGELPILEVVGGTVFARWRWLRVPLYS
 PGDPRLEEFHDRVLEAWMECKGLGKKPPSPPEMVAVTAILPTVTPIAMRKGAKTSP
 SGRDYLGLKLIHWILVKVAKALKVSLWAAATIAAAIYFGPGATVSAVYWAIARRVDSVP
 30 VPKSRIKHATLTFLEYNALLTGLLAPVIGILYLPLRVHCPRLAIALALGAVATMAPSV
 RAVSHYRRDPVGYTAALLNDGILVPEVVLIGAGTSVLLLVLVGAVPAALTIVATFLFHA
 VIVLRRIERAAELSRRAWKLRVSRDGTGGNIPHTGGS
- 35 <SEQ ID No.:1171;PRT;Methanopyrus kandleri>
 METSRVRFLRYRTHLLTYVIVAYLWDPKHALAAALGSLLPDL DHPSSVASRALVPL
 EKATLLPLRRLINTVVGHRGILHWPVPWALGAFLAWWVGHTGLAAVLLGGCLHCLE
 DALTVRGVPLLVRDGGGRWRWNLRLTPVPSDKWDAVLPPATVLLLCLVILACPSE
 FHTLGLDRIPGLEKVYWTIHERVYHRLHPFDAYVGTFAREILRLEPMAAFAPC
- 40 <SEQ ID No.:1172;PRT;Methanopyrus kandleri>
 LVAHRGRLFVETDGKLLGSCEASLIVTEENVVVVPREPIEGVDTSDLVVESVASRFD
 SAELEEGNFTPPRSRVMTPTAAS MIDLGLALKRFEVDGVTVLT VVGPA PAYPFE
 RRILAPEGEMTLRFEPKDPVAAEGSLRAAARA AVEGTVGETVGRSKAVRLCKVLVE
 LNQTVGHGTLRLVPRDENVLLVLQPEEDIAEEFKDAVGKSIQIGIALTPPELSAVFSGK
 45 AVVKHGKEDTVHVL DARTIEFRAEGKGWALRAVPTDVIAGSTARVLLRTAAELIVH
 EGLRPE
- 50 <SEQ ID No.:1173;PRT;Methanopyrus kandleri>
 MRSFPLLVALVLLPAAAHAGKISVTVPESVNVQGNALGIHERLEKELDLIVTVTDL
 GTGAVYDMKFNPLEPSSPAGLDVTGPVTVIATVRYARNIVTRFNWPEGASSFSSV
 DVPEGRLETTVNHPRISVPSTGTDFDECPITMSLR TDKGT VTKLLLHVSGIDVKGV

KAERKGVLPPELPSVVRLLIPVAVALAPMVVIPGFILIDLTLNVNLGLKSTLGPVLDHFLG
VLGGLLPRPG

- 5 <SEQ ID No.:1174;PRT;Methanopyrus kandleri>
VELHERHLAPSTTGPVTLYGVPIPVLIAMPFYLA AVGRGVLALKWAWRAGNTVRTA
SIVASFAVLTLVLSVPTVTVAAILLLVSTVLFYLFNTFIPRYDRFYVEYRRRWGYDEA
PKHEVLELARECRLDVLPPALKLLNGTAYLAAYNERDNPNGWDPIDRFHRLLLAFEE
GSWKGGYVGPNAWRIVRGVAELSLDHPEVELARRLEE
- 10 <SEQ ID No.:1175;PRT;Methanopyrus kandleri>
MSVISKDPGTITVVRVDDEALSKAYSADKGARITDWFGPVELSPGSHDVGIHLVLD
GQEV RWYGSVVKVMSGREHVRDHDEYEH HREEHDHG GTTRINPRRSDFPPSGSR
SRGPRDHPNSR
- 15 <SEQ ID No.:1176;PRT;Methanopyrus kandleri>
VSVPKYLPLLIAVVATASPGYLGVEAFVTGISADHVDVVMVYADSDDVTKSHRV
TLVLPPEATIKGVKSYQLPRREGDVDVYGQGDWKPETGTWSETARSDPRSSFPK
RPPMSSTCT
- 20 <SEQ ID No.:1177;PRT;Methanopyrus kandleri>
VLRAIAVVISALVLAVPALAEPQADLRALGEKIGNDALTTLGATAGDPKLLVITDARAV
WVDSGDGTPDTPAAAVADAVASETGCKIGENLVFVQSKPASDLFVAVFYGDESS
GKLVFYRVTHSLLDRIARGEVSVDSTFTSDPSDENGIRYVVLGDLTAENVFRELLS
AAGIDPSGYMTDGRIDLQKLDEHGWDFDPDKYTDEALQSFNDKYFGKMC GFGFT
25 VLSIALSWANGLPRRYLASVERHDHLCPLISGMLIVDKLLREGKAEAVRFYVACPI
WCKDDAIYTTLDLTQGKR NHFV FHPDSRERDLLNRKLGGSPAGVFVLQEGEDLKAL
VATFKWVNWGA VFGKLARAGWGSVKGRVLNSMIRIICDVVFCRDWNVD RVGLKEY
PMTCTEAAAICAGRDPYMLVGLVAPYTDDPKVA AVEQALLYARKVLGLSYGDERAY
VITNVTYLKDFVDGRVRNVITRTLGLDATFSGSNRSIQVTTLEDRIEFHTDETADPVI
30 AVVNAETGEGVAVVLDLAKLEGKRAEDILTMDPEEFVKEYAKAYTDKVKMNAFEISD
EDNDKLSRLGRYAFNVVTLATAVNVGVPKDLLRCAAWHNHFCPGVTSGWMI AKYI
QEEILAKEPLKDNERLVWIGVPVWCKEDAVQTLLDLTPGKRGEFVMQLPREVQEEL
KREYGIDVAGILIRYQYTGKGKDEQILGGKAYVIGFDWDKANEIRPNVQYFGHAAWA
VELAKRDPREFVRVIKEISLGAEDVKKLTEDTARVNPLEVVGVIHNP KPKRKP VYW
35 VTVALALTLLVFRRLKPS
- <SEQ ID No.:1178;PRT;Methanopyrus kandleri>
VLAALILVTTLP TPAHADIGYVGYDPEDAAHWSGVGLLQHPYVAWRSGGYKTATL
ADGKLLLGTDSDGRDDALVEVDPATGHVLRYSLEFDPGDCSYSVPLVAHTREGTW
40 VIKAYRTTKDERNVGAILAINIGDGATRYLVADLGPYEVEETRVPTVFPVACLDVDG
DGDEEVIVEAPSGMFCYDVTPEL KRLWWFKCEPVHLPDGVSLPAILDL DGSRLLV
LDVRDGV PVLHAVDVGTGEERWSIDLTHQGVPRVKGYRSVWKVMTGDLDGDGKP
ELVVTLPGAQRSVQSCGLATKSGESYLVLRPRTDGADPVTVLKISDVYPLNSGF
GHPAALGDIDGDGKDELITFFTDRLRVFKLHGDRLEQVAEVKPGVTVFWSSVCLIDL
45 TGDGRPEVLLSGNPGRTVALRYDHGQLYVLWEVPYPAQVNLPVPVDSDRDGKVD T
LVLYSTEHGIVALKAGRTAPTRGEKSEGKRRRLPLIPVPIPRRRRLFVATLVAVTM
AAPVTATVPLYCEDRADPSTVQALKSEVHRQIVDAVHWLAEQEKPTEFETEFYFPGW
YYDPNPTGEPRRFSAMDTAWVLFGLAHCYKAGIERDLCLELIKGLTAEACQDDE
GLIHDVPVKSLGAGSFTLGCAVPTAPSSEEEAQQKKEWVG FYTSQSLPGIVAVYRL
50 VDDPEVKERAKRIAYRAIEAMFKHYWREEVTTPEGTVEIGYFQIQGPGAWSDRTR
TTPLVLWAILWSGYRSWNDREVQLMWNLLRFT EKERTVRGIPVAHVGD IKIDCDSW
TLCALAAVGNTVDSGPLSDLVRKLVN CIMAHTKPTRGGLMAVACHFGELEEEPGKA

FLAHKAARAYYGLLQAGVPPDNRLVTEIVRFCLKAHRIDPNEKDPVTGLQGTYKDDV
PYWCWTDVWKNDRGLKCFCTGITLAYLAEWYSLVEGNEPSCRSKTERHRVPV
TPVILPLCPRRARRD

5 <SEQ ID No.:1179;PRT;Methanopyrus kandleri>
LEIEVTEGSFVSEVYHWLRKEGLPAVAQVRIPGVRGRVDLLVMDRRPVVVEVGFP
VEITDEDLRRALRYVRAIIEWNSDVEPAIIVTNLKEAWYRDDPLGEWEKEELEDPTS
DLIVLVRRLARAEIETEEQKGPEETEDTDRMLP

10 <SEQ ID No.:1180;PRT;Methanopyrus kandleri>
LNQGPTVLRWQRPPTCVPEPHRLTLRNIATIHDPRLISGTISRVLGAESGAQG
WIYGKKAIGWRERSAELELATLNNPTFGVGRKAEEDVEWEHWIVFHSVPVGVRI
GDVELPTEEPLTVKSIEVDCDSKLMKINFKDDARSLMRLEGDDHSHWELKKCSANV
KFNMSPKVEDEEVKCIYEIRAEKENFSLKTIDNVIEYLQEKEVFSCEKIWEKPEKAKS
15 KSRVSKYIEILVEVELSNFIDKVSVDVDYRLNGKKKFKVVD AELLVVLNKDKVKKEL
LERLYGVSGDIDFADEVLFLLTFAPHARFKSSTS

<SEQ ID No.:1181;PRT;Methanopyrus kandleri>
LVEWREVPVLPKNTFFKKLNAAIAWIDPFDEFANPDVKELLAGVSELDPNPLLHWS
20 NVLSAEHPPEEWRIPIYELAEYMVCFNKAGAAVLRYFADALRNVFERPSLDRLVRPL
AIEMALSDGDELPGVLRSELGIEKGYRGLGKGLPDALRPSRWLLVSVSHACSNRK
ARPEEIAEEFEHLGFELEGPEVIDRLRENVEEAVEDLVTWASREGEDPKPYVEVFR
EAVTATLRRSIRLVRRPEEIAKSLKVDPTVSIGGVKIGPEDYDPLWVERVRQVDVEE
VTAEIVDELLDELTRR

25 <SEQ ID No.:1182;PRT;Methanopyrus kandleri>
VLQALAFVLLTIAPAAVHAGQVTNVALDDMVSNGAELGTYDTLVSKLTLDVAVTD
VGTGTTHTAEFKLSEVPKSVTFEGIRGPVTVSVTLKYDGKTALAATLFPDWPCSSAT
VDPDGMQLQARVGCVSQYVADTEFSTECVAAELYPGLHSTEIPEDARYVLAKFNV
30 KVKAEGLAHGGSRARIHLDDVLDTAMD LAELVLKYMPPILIVAPVLVFIGPTAVEMFA
EFLKAILVAL

<SEQ ID No.:1183;PRT;Methanopyrus kandleri>
MEIRKLRVAVQLISAGVAAGVAFGLKVVPGLAAGCAGIIDTGTMLLALPVVAAGLV
35 TLTQLAAVALVGWVVPAILVGGAVCGWICPLVLVQDALAGLGRKLGLTVHRPPGHG
VLLYLRYVILAATLVLGPFAAYKLWYKICPMHYLSYILLGRQEIGLYSVLKMSAAFGL
GASVFVPRFVCRYICPVGVLLRLANGWSLLDLLKGKTEIVRKGCKGCKVCTVCPK
ALDPADAFPNDFDCMRCGRCLDCPIHLKMVGEG

40 <SEQ ID No.:1184;PRT;Methanopyrus kandleri>
MLGTLGFRAAVMAAILAYILTVPSHLGGVGKSVEDIAKEAIGGGDKGSAGEKDEEVS
EKGEGEGKGEKSGGERRPEEGSSGSTGGGSSGGNGTYAGSSSSGGGT VTTGSS
SGSSGGFVCTGNCAACPNPCH

45 <SEQ ID No.:1185;PRT;Methanopyrus kandleri>
VRILTLLVAALTVLGAVSATTYICPVTGRYFDDSTARGQHCGAFVDKNGDGYCDNL
QVLSEETSDSSAETTSTSSNTSEQQSSTASTTSSTTSSTAPVGLVAVIAGLVAAV
LLRRL

50 <SEQ ID No.:1186;PRT;Methanopyrus kandleri>
VSEAEVLRELIEELRALRHEIYMLRMELERLRGEVEEVESEDDIPDLLRAERAEM
AVGDIDLELESDEEGRWSLL

- <SEQ ID No.:1187;PRT;Methanopyrus kandleri>
LESYRTLLAVLLMGLLFPSSWVVGKVRVESTGMPFATYYQNVKMSEVLQKRPRVLV
LDPWCGPNGRPWTKEELRKIKDAGVKPIAYLPVCVVAEYHPNLYREARRRNLLGAD
5 DPEWPGDYAVKFWEPAWRDVLRSELARLKDLGFEGVFLDVVDAHSRDWYVRWY
DRVNPBGDLRRDELNAVKWIAQTAHGLGLRVVNAGAWAFEGDGMARLQSR LGF
AVTVESVLSDGSRRLYSRSELESNLRTL SRFQGPVYVIEYGLDPDDPSVRRAAEKL F
DKTRATCVYITSVKHDGIGVALVPLRRWLWDVTLGPLLGEPPSWIGGGR
- 10 <SEQ ID No.:1188;PRT;Methanopyrus kandleri>
VSPHTSSAFGDPARFIIPRTGRPRPLPDGAPGTRVHPAGHRGTGRPSYSPLALSSA
RAVTIFSDGAYPPPPRNTNLRSECTPDTSNSAVPVHPQTSSVTTRQRPSSRTYIRTV
APGRASPVLASTTATYTRSLPAYQARILVGVFPA
- 15 <SEQ ID No.:1189;PRT;Methanopyrus kandleri>
LTSAVVVEGLKKVYETETRGEIVALDGFDMEEVEGEIHGVLGRSGAGKSTLIRILRGV
ERFDEGRVEVCGVELTPDSPKSRFTEVKRITAIHPQREFGLWPETAENVMRKLYW
KRRGAEELPPEDSSEYEEL YEEALEYL RIVGLEHKADHYAPVLSGGEKQRLLLARQL
AKDPEVLLLDEPAAMACPGTKQQLLDAVRNANEEKGITVIVVSHL TEVIEYLCDSATL
20 LEDGRDVLHGSPREAVDRLTRGMPEPERVPEPRDEIAVRVRDLEKRYALVRCGETL
HMRGIELEVRRGEILAVVGP SGAGKT VLLRMIAGLELPDSGDIEVRVDGDWVSMTD
LGHGRMEARRRIGIVHQEFGYVHHATVRDLLAGRLGVKSSTVLEQARRRAEELGLG
EEALDVL YALTDLPREEAEAKL KELDLS PDILDELFPKFPSDEVERFARPVFEEDLP
MEVLDMKFGELSGGQQVRVAIALELATEPEVLLLDEPFGDLDPVTLRSVANSIKRIV
25 DREKIATVLVSHDVRFEETANRAVLVDDGEIVMEGDPKEVCREVERSEARFLEG
- <SEQ ID No.:1190;PRT;Methanopyrus kandleri>
MHRYCHSDLIIPY GAGRSRITVRLPGPVHRWIQREHGSVAGYVRKCLEDELTRVM
LRELADSGSGRRLSTSLELPEDLVRELDEVADRLGISRNELVTCLVREFLNEMTAR
30 RTVRSDVVCVLRELLNVLEEGWKLDLGRRRGIEEGLRDRDAR
- <SEQ ID No.:1191;PRT;Methanopyrus kandleri>
MAIPMHAIPSRVEGIELGPLGVEVEILRESHGLLYPWARLLSETSFVIIAVLGWTYLR
DRRTSYVLATTVGT LVTVVLKGLIGEPRPFVLHVVSPLTNPDEPYGSFSPSGHTSR
35 SFALAAAYHLERRDAL TAILWIWAALVGCSRVVLGVHWP HDVIGGALVGITVAVATH
RTARLWVRFLSIVDPLARGVRAWRWYVR
- <SEQ ID No.:1192;PRT;Methanopyrus kandleri>
LAMVREVIDFVEELAPPD LAEDWDNPGIQVCPPGGGLDRKAERVLVALDATHALERA
40 GDADVLVTHHPLLFRPPRRIGGRWYRVLRAVLEADAVFYAAHTNLDRAEGGVADTL
ARRLNLRVEREACDGFGR LCEVPGSEELLNALRNLSPLTTVYGDWEGVSRVLV
PGAAPDGLVMECLRCGVDAVIAGEIKYHTRAELLEEGIAVVELGHEYSELPGVQELA
RRVREEFRDLNVEVPPPDITIIR
- 45 <SEQ ID No.:1193;PRT;Methanopyrus kandleri>
LRTVGLERKILVIVGDGMADRAVPELDGKTPLQAADTPNMDRLAREGSVGLLDPIRP
GVRPGSDTAHLTLLGYDPFEVYPGRGPLEALGAGVEVRPGDVAFRCNFATAEERN
GELVVDRRAGRINEDEGTPKLAETINEEVDLPVEFEFKEAVGHRAVLVLRGGDL SA
DVTADAPKRVGKPKVDVKPTSDDPAAARTAEIVNEFVRKAYEVLKDHPVNRERERQ
50 GKPPANVILPRGAGQLEEVFP SDRYGM SGAVVAGASLIKIGRMLGMDVPEDEAI
TGRKDTDLKRKAELALEALDDHDLVLVNFNAVDEAGHDGDARGKVEMIERMDREL

VGTLLEGIDPEETVVCLTADHSTPVAVG DHTADPVPVAIWTADARRDPVEEYDEISA
ARGCLGRFSGHLHLLNVLRDLADRIEKFGA

- 5 <SEQ ID No.:1194;PRT;Methanopyrus kandleri>
MSITETLVAYFMDFERAMGLPGMLVITALECSVLPVPPEPFVFPFAMRMDPWVLATL
VTLSSIVGSLG YAIGYFGGRPIAVRLVGEANLMRVESKLTEHRFSAWTAVFLAGLL
QFIPFKPFTIGAGLVEMDLRLFITAVVTGRFSRFLFLGYVAQSETVRNWISYYLGPKA
LKMLMSTG
- 10 <SEQ ID No.:1195;PRT;Methanopyrus kandleri>
MVDVLIVLGSRSRDRVAEKA AKVLD RAGVDYNVRVASAHRTPERIDELIEEYEPDVK
VYIAIAGLAAHLPGVIAAKTLKPVIAPVPEAKLCGLDALLSTVQMPPGVPVAVGVDR
GENAALLALQILALEDEDVRSFLEEYREEMKKQVARDDDTIKERFR
- 15 <SEQ ID No.:1196;PRT;Methanopyrus kandleri>
VTLGERTGRGRSIAERSLERWTEKLGEPENLEDLLTLRLSHATWDPFVSETLMIEPS
EEAVTEGLKSAEVVAADVGMVAAGIRRSVERLGLETVIASEVGERIPEDTVTGDGM
RKILEDHRNVAVVGNAPTAAEKVAEYPESIAVAVLFPVGIGAMEAKRAAMDAGIPV
VTNVSVRGGTPLAVAAFNALADCVTGNAP
- 20 <SEQ ID No.:1197;PRT;Methanopyrus kandleri>
LRSGDIKEGVERTPHRALLRACGLTDEEMDRPFVAVVNTYSEVVPGHMHLDKVTEA
VKAGIRMAGGVPFEVETIALCDGIAMNTPGMKYSLPSRELVADTIETVIEAHRFDGFV
AIVSCDKMVP GALMAAARLDLPAAIVTGGPMEPGCVDGERVDLIDAFEAVGAYEEG
25 EISEEELEEELEQRACPGPGSCAGMFTANTMACMTEVLGMSEFNCAATPATEAEKL
RVAKLTGMRIVEAIEEGITARDVLTREAFDLAIRVDMALGGSTNTVLHLLAIAREADVE
LSLDDFDELSRETPHLCAMRPGGPYTMRDLYEAGGVPVAVMKELADDLHLDRIDFAG
RSMRERVERTEVKDREVIRPKEDPVHEEGGIVVLYGNLAPKGAVIKTAALSEEMYE
HEGPAVVFDSEEEATEAILGGDIDPGDVVIRYEGPAGGPGMREMLTPTAALCGMG
30 LDDSVALVTDGRFSGGTRGPCVGHVSP EAYRGGPIAVVEEGDTIRLDVRERRLEVD
VEDEELEARLEEWEPPEDEV TGYLRRYRELVRGADEGAVLR
- 35 <SEQ ID No.:1198;PRT;Methanopyrus kandleri>
LGL EALDPYGV LKGVIELFVVVDPIGNVPALLAVTSEL RPRDRVRVHRAVAF AAVLI
LGFAVAGKATLDYLGISVEALMIAGGILLRAAFGMVEGDPTGFRIEPGSHIDVAYVP
LGTPLLAGPGAIVTVIVMLHRHGRLETILACLIVMLLTLYTFRAAERLARFLGRSGIRV
LTRVMGVLLAAIGVQMVL DGVSAFVRG
- 40 <SEQ ID No.:1199;PRT;Methanopyrus kandleri>
VPANLPPEYHELEEKYRKARSPEEKLRITEEMLAVVPKHKG TENLRALLKRRLAKLR
EEVEKRRQKQSGGGPDYNVKKEGAAQVALVGPPNAGKSALLREL TNADPDVASYP
YTTKEPVPGMMEYKDVQIQLVEIPPIYEGFTRGDGSKFVG VIRNADALCLVVDLTED
PVEQLETVLRELESAAIKLNQDPPSITIEERTVGGIEIRGEDRLDCDPNDVKDLLRDA
GIHSAVVVIEEDGITLEDIADALDKRIEYKPA LLVANKGDAPGSKESYERLVERVEDLE
45 FDLPPVPVSAEKGINLDEFKRRLYDTLGIIRVYTKKPGGKPQKPPIVLPKGATVEDVA
REIHSDLAKNLKYARVWGKSVKKDGMMVGRDHVLEDGDVVELHG
- 50 <SEQ ID No.:1200;PRT;Methanopyrus kandleri>
VRTLRVAACVLAAGRSTRFREALEERGE EEPVSKLVYPVAGKPMVAWVVERASRVV
DELLVGLGYDAGLVWDVVRQHATVPARPV LNDPVDVPMARTAANLLRRSDADVSLI
LAGDQPTVTAETMRRLAETA AEHGASVLDRGAPNEEVSGDDL LGHPPLALRKDV

VPEFLETIEELAADVIRGPNALNLPVLRECGLAFRVVPPRDDAELNVNTPDELPEV
ERALLRSD

5 <SEQ ID No.:1201;PRT;Methanopyrus kandleri>
MIDGLGTSELLILAVILLLLFGPKKLPELARAIGEAVGEYRRAQRRVEWELEAEERRK
EKEKRDED

10 <SEQ ID No.:1202;PRT;Methanopyrus kandleri>
LDSWSEKLDVDVWELLKPCARNRNIARILEALLTRLALHWIDDLPTTGTTYKDPSR
RSGCSGTGVIEAPRGTLVHRVSVGSDGKVFNYEITSTNLNHAPIEESMVGERVYVD
EKLAACKRQLSESERFLLGDACRAARSFNPNCSAPHAIKVVKKGWTNSGAPTEV
PRGGTEESAIEVISGRGAHVERGVPLRRDAAPGRP

15 <SEQ ID No.:1203;PRT;Methanopyrus kandleri>
VVDNLYDQFVKYHGDAQALVAVFTGKSVHLATVCVGGYAGDVEKLSGLYSTVRTR
PESMRSFLESVIPTLWKYLSMHLRDDVGDRAHMISSGTPFYSGLASGYVHSYLA
SGGVLIADTKDPGSVERARLVFPYPERVGKITLARGSNLDERCYSYSEVGYEYEWNG
TKYACEAGPLTRFSGSLQGRG

20 <SEQ ID No.:1204;PRT;Methanopyrus kandleri>
VCSVSLDGLLETPIIDRTFLKLAFTGVLSVLVSEEPVRALIRSVPRSVVLVFGGSCGG
CTTTLAIEIGIDLKASPTWIPRSGLSGAH

25 <SEQ ID No.:1205;PRT;Methanopyrus kandleri>
MEGLLTIVRRLRARRVVEVGHGRNLRYLKGLLKAGIDAWGVEIDVQHVRRALEEEV
PSVNVDAVEKSRWVRRVLRPDLVYAVRPPVELAVGLIERYPTVALRMREEERHELP
EPSIQIGDWDLHTVLDLHTFEEDRTVKPQISG

30 <SEQ ID No.:1206;PRT;Methanopyrus kandleri>
VRWSGRAHVFGDDVDTDQIIPGRCLRRVSYDELGRYAMTGADPEFPEKVREGDVI
VAGKNFGCGSSREQAVMALQQAGVACVVARSFARIFYRNAINRGLPTVEAEEDPTE
VVEDGNRVTVDLDELVLRLAGSEEVPLREPPEFALQAWREGGLLELVKKNPDKPPW
RD

35 <SEQ ID No.:1207;PRT;Methanopyrus kandleri>
LSERLNRFAKFLDITVHIVMISILAITLIFGVGVYDIVSTFLTSPYQVRFRMTFGLIVE
CVFDVLLLEVVYQSVLETLRHRRVPLRYVVDITIIMILRETFLKYRGTIRPMEMLSVT
AMLTVLIASRVVVLKYSPDYFKTHLERIRGQEREVER

40 <SEQ ID No.:1208;PRT;Methanopyrus kandleri>
VPSVAERILSEKVGEPEAGETVYVEPDVIMLHDGSGATALRTLRELGVVERVESPEK
VVLIFDHSVPPSSVEAANRQNELLEFARRHRIEHVHVDEGVCHQVLVEEGYAGPGR
VVFGGDSHTPTSGAASALAFGFGGTDMAFALLYGELWIRVPRTVRVHVEGELEPA
TAKDLALTVMGELGAGYADYAVLEYTGLPERMSLGDRMCLCNLATEAGAKSAYVPP
45 KEGPEELRPGDADEVIELDASEVEPVVSVPHRVDDVRPVGDVQGVETRVFVGS
TNGRYRDVRVFTEILEELDGPDPVRIVVPASRRVLERMTEAGLTLKLRMGVMIA
PPGCGPCLGEHLGVLGDDDDVCVSTANRNFPGRMGSRRAEIYLAASPVTAAVAAAEG
ELVDPQDVLG

50 <SEQ ID No.:1209;PRT;Methanopyrus kandleri>
VQSPYVREAVREMDLPDEVIVYDITLRLDGEQTPGVSTPEQKLEIAHLLDELGVQQI
EAGFPVSEGERDAVRRIAHEGLNADILCLARTLRGDVDAALDCDVGIVITFIATSEL

- HLKHKLRMSREEVLRIADTVEYAKDHGLWVAFSAEDGTRTEFEFLERVYRTAEEC
GADRVHATDTVGVMIPAMRLFVAKIREVVLDPIGVHCHDDFGMAVANSLAAVEAG
AQAISTTVNGIGERAGNAALEEVIMALKELYGIDPGFNTEVLAELSRKVSEYSGIDVP
PNKAVVGENAFRHESGIHVAHVLEEPRTYEPIDPKEVGMNRKIVLGKHTGRKAVVA
5 KLEELGVEPEEEIVEEVLKRIKALGDRRVRVTD SKLEEIVRNVLESRGDRDDPGSR
- <SEQ ID No.:1210;PRT;Methanopyrus kandleri>
MVGEGVRLVRKIEEPVKLVYLLEGDKVDGVPVAVDWILERVRELGLRGATVHRCFA
GCGRGRGRSEARILRTSMNLPVVVEVVD SREKVERLLELLKERLGVGVVTLERLEVA
10 YDLEG
- <SEQ ID No.:1211;PRT;Methanopyrus kandleri>
VVKIGARELAAVAIGGALGAVCRYLLSGLVPQVRGFPMTVLNVNLGSFVLGFLTW
STMLGLRLSPEVRALATVGFCGGLTTLSTMAYETVELLKASPVLSILYLTANVVLGIA
15 AVLGGMAAAHVWWSGRA
- <SEQ ID No.:1212;PRT;Methanopyrus kandleri>
VREIELWTAVLAVGVVQGITEWLPISSEGGATMTMMKVLGIPPSTAMDLALWLHAGTL
LAVLLRFGVPYWLTVRDLLMGGPWRRLLGLFAIVATVCTAVVGLPVYKVLKGIFSAAT
20 GDAVQMAIGGALIVTGLLLRISPEGLRDRREVNVDVAVIVGLGQGFVIPGISRSGTT
MALLLWRRFDGGEAVWLSFYLAGPAMLGATALELKEGLSAATKMGTSWMVTAIGV
SFVVSLLICMEVLLRVARRLD FSKVCLLLGGIALLVPLAAKML
- <SEQ ID No.:1213;PRT;Methanopyrus kandleri>
25 LTRAVTVIGADRP GIVAGISSVLA EHNANIEDISQTVLRDLFAMVMLVDLSEADVSV
GKLREELQKAGEELGVDVIVQHEDVYRAMHRV
- <SEQ ID No.:1214;PRT;Methanopyrus kandleri>
30 MSSLDVEEVETIEMIRMNRNL D VRAVTLGINLLDRAHPDPEELARDVREKIVEVAGDL
VEVVVEEVEDELGVPIVNKRIAVTPCSIVAASAVRKEGREAVLTLAEALDEAAEEVGVD
YLGGYTALVYDGFTEADEAVLDTIPEAIEGTERLCASVVVADERYGINMDAVYRTAE
AVKETAERTDGHG CARLVALTNAPENTPFMAGAFHGVGQPEACVNVGISGPGVVR
AVVEELKD VDFRTLHDEIKRTAFKITRVGELVGRRVAERLGVEFGAVDLSLAPTPEE
GDSVAEILEGIGLESCGCPGSTAALHLLMDAVKKGGAAATSRHGGYSEAFIPVSEDA
35 GMARAAEEALTLEKLEAMTAVCSVGIDMVVPGDTPVETIAGIIADEAAIGVVGTGKPT
AVRIIPAPGKEPGDEFEMGGLGRAPVMDVSDYRPTMFRRDGRIPPKFPR
- <SEQ ID No.:1215;PRT;Methanopyrus kandleri>
40 VNASPTVVVIPGDGIGPEVIDAALKVVRAVLGDELEIVEEQAGYSLWKKRGVTIEDET
IERCREADAMLF GACTTPEDPEAKSPIVTLRKELGLYANVRPARSWPVPRPVDTEF
DLVIVRENTGLYTGCECEIHDGVTVALRKISEEGTRRVAEVACDLAEERSGRVTIV
HKANVLKLT CGTFKRVA AETVERRGLEWDDEYVDAAAYKLVREPD SFDVILTSNLF
GDILSDLAAGLMGSLGLAPSANLGDDAALFEPVHGSAPDIAGKGIANPVAAILSAAM
45 MLDHLGYGEEARIIERAVEEVLREGVVRTPD LGGSATTEEVAEIAERVATG
- <SEQ ID No.:1216;PRT;Methanopyrus kandleri>
LPITPRNIVRHELIGLECRVVKSLGPPYEGLEGRIVDET KNTLVLKTESGEKVIVKDQV
LLELKLPSGERVRVDGALLVGRPEERLSKRIKYAEVVRRGRFDPEDYLD
- 50 <SEQ ID No.:1217;PRT;Methanopyrus kandleri>

LTGEYRMAKDIGLGVKPPRRECDDPNCPFHGNLVRGMILEGVVVSDRMDKTVIVE
REYYRYDRKYERWERRRSRIPAHNPPCIDAQEGDKVRIAECRPLSKTKSFVVIEVLE
RAQER

5 <SEQ ID No.:1218;PRT;Methanopyrus kandleri>
VKAIKAKSPHAALPVGARLVCADNTGARELQIIAVKGYKGVRRRLPNAGIGDMVVCS
VKEGTPDMRKEVVNAVIVRQRKEYRRPDGTRVKFEDNAAVIVTPDGAPRGSEIRGP
VAKEAAERWPRIGSIASIV

10 <SEQ ID No.:1219;PRT;Methanopyrus kandleri>
LRWTKSSQPRKQRKAFFNAPLHKRQKLMSATLHPELRKKFNRRSLPVRRGDMVRI
MRGDFKKGHEGEVVEVDLKRRLRIYVEGATIERANGEKVYYPIHPSNVMIIEPNLDDPM
RRKIIERSGGTPEVEAVPEKSEEEKEEKEEKEESEE

15 <SEQ ID No.:1220;PRT;Methanopyrus kandleri>
LGRARSGPKRHVKRLAAPYAWPIPRKEGGKFAPRPYPGPHTMDTSVPLLILVRDML
GYADYAREARKIITRGEIYVDGVVRKEPKFPVGIMDVVEIPRTGDRYRVVMNEHHRL
DVVPISEEEARVKVCRICKNTYVRGGNLQITMHDGKNWLVEIEDPTDPKEDVYSVG
DSLVLLELPEDSGESWKVVDHIPFEEGVWVYAMTGRHSGEVGRVVEIQTFEGPQE
20 DLITVENPEGDQFQTTKGRLAIGKDEPLVTVRKEE

<SEQ ID No.:1221;PRT;Methanopyrus kandleri>
LSVVDEETRRKILEDWESNPMRKPRVGKVTNIGVGESGDRLQKAYELLQELTGQK
PVYTRAKQTNPSFGIRRGQPIGVKVDLRREQAIEFLDWTLDVAVDRELHESQFDEFG
25 NVCFGLEEHIALEGVEYDPEIGIFGMDIAVTLERPGFRVMRRRRRCRRPVPRRHRLTK
EEGIVFMEEFDVEVLP

<SEQ ID No.:1222;PRT;Methanopyrus kandleri>
MARREFGKGARRCRRCGDTHGVIQKYGIMLCRQCFREVAEKMFGFKYN
30 <SEQ ID No.:1223>
LTLMDPLADAMATIKNEMVGNKECVIEPASKLIGRVLKVMQEYGYIGSFEFIDDGR
SGKFLVKLVGRINDCGVIKPRHPVKKDEWEYWEQRYLPARDFGLLIVTTPEGVMSh
YEAKEGIGGRLLAYVY

35 <SEQ ID No.:1224;PRT;Methanopyrus kandleri>
VAEAKFEPAKDAIPGVVMEERVKIKDDVEIEISQREDRRYEVTVKGPKEVTKEFY
PDVYLWVEDDEVVIAATRSNRRQKAILGMIKAYIENMQKGVTEGHEYKLKLVYSHFP
PEVKVDQKEGKVYIENFMGENVPRVAEIVDPENTEVIVQGQDIIVRGIDKEAVGQTA
ANLEQATYIKDRDPRVFQDGIYIVEKDGGKIV

40 <SEQ ID No.:1225;PRT;Methanopyrus kandleri>
LVRNPNSKEEERLLKLREELKRKKPKFRRQEWHRYYKKLGEKWRRPKGRHSMR
RKLKSKPKMPNPGYGSPPKVRGLHPSGYEEVLVYNPKDLEKIDPKRQAARIASRVG
RRKRQEILEKAEELGIVVLNA

45 <SEQ ID No.:1226;PRT;Methanopyrus kandleri>
LSEMTYKDAGVDIDKEAFVRAIRDVLEKYKVEPEGCREVEGIGHYAAVLEVHGELL
TLNVDGVGSKVLVAQLVGRYDTVGIDAAMNANDAVCLGARPLAFLDYLMEDPDP
DVCAEIAEGLGKGAREAGAPIVGGELATLPEVIRGKEEGRGFDLVVACLGRVEGDPI
50 TGEDVEPGDAIVGLRSSGIHSNGLTLARKVLLSEYDVHDELPHGRTVAEELLEPTRIY
VRPVMEVLRDYEVRGIAHITGGGVENLKRRLDDVRYVLDDPFEHPVFEIIRELGNV

PVEEMYRTFNMGMGMALIVPEEEAEDVDTVSKHVEAKIVGHVEEGRGVVHMDG
HEVKL

<SEQ ID No.:1227;PRT;Methanopyrus kandleri>

5 LSERRGGEKTL EEVKKKVMERVEEVLPSDVVVTDVDFEGPEVVLYTNSPHSFVKDD
SDLVTRLAKALRKRVKIRPNPAALSPAKEAKKVKIIP E EAGVSE RDLLFLDTGEVVIF
SKKPGLVIGKRGKNVHRISRDTGWVPR IYRQPP IPSKTVNTT RRLILSDDSRKFLR
NVSARIFCGRTRSRGTESRWARVSALGGFQEVGRSSLFLHTEESRVLLDCGVNVA
10 ANGTDAYPHFNVPEFRMDDLDAIVITHAHL DHCGFLPYFYRHKVIESRPVYCTPPT
RDLMYLLLTDYIKVLEKRGQEPPEYTEKDVKKVIKRTITIDYREPTDITPDMSITFYNAG
HILGSASVHVFLQDKGHN FVYTG DINPTPSRLLEGADNRFKRVDSMVVEATYGD SR
HGSRRKEENRFRKIVRDTLKKGGKVLIPSAVGRAQEVMLVLED MHRKDELEGPVY
LDGMIYEATAIHTAYPEYLNRR LQHRILHEDDDPFTSEVFEPVEGSDHRQAIMEDDE
PAVILSTSGMLEGGPILEYLRELSDDPKNTLIFVGYQAEGTLGRQIQEGAKEVPLPTP
15 TGKTETLRIELRVETVSGFSGHGDKIELTKYVRSIRPSPPSKVFTNHGEPRACKYFS
NHLRRTVRKVFSMAPENLECFRLT

<SEQ ID No.:1228;PRT;Methanopyrus kandleri>

20 MKELDQLTKGTTTVGILADKGVVLAADRRRAVMGNLIAGKQVKKIFRIHDYIGVTTAGS
VADAQKIVDLMRAEARLYELRHNR MISARALANMISHVLHSSLKAFRPYLVQLIVGG
FNDDDPALYNLDPSGSIIEEDYTATGSGSPTAYGVLEAEYEEGMSLDDAEVAVRAV
KSALERDTGTGEGVTVTITREEGYRELPEEEVEKLLS

<SEQ ID No.:1229;PRT;Methanopyrus kandleri>

25 LHAFLGNAQLPSTPRGDRLEFSEWYAEVLRSAEIMDVRYPVKGMVWLPYGF EIRQ
RVVEKLRRKLRETGHEEVLFPTLIPETQLKKESEHIAGFEDEVYVWTHGGLKELDEK
LALRPTSETAIYPMFALWIRSHADLPLKIFQIVNTFRYETKHTRPLIRMREITTFKEAHT
AHATEEEAEQVKEAVEIYSSFFDELGIPYIASVRPEWDKFPGAEYTVAFDTLMPDG
RTLQIGTVHMLGQNFARTFEV TYETEEGDQEYVYMTCYGISDRVVASMI AHGDER
30 GLVLPPDVAPYQVVMVPI LKKGVRRKILERA AEVEEMLREEGVRVKVDDRDMSPGR
KFHYWELKGVPLRIELGARELEEGTAVVFRRDELERETYAFEELPDVVP ELLEDIAM
ELRKRAREKFEKGIFRTDSPEEARRLVGEGIVETGWCGSERCGVRMEEEFGGDVL
GTPYPEEDTEFERCPICGETAEYTVRIAKTY

35 <SEQ ID No.:1230;PRT;Methanopyrus kandleri>

LSVPKKRMQLPREVVVGS NVLPEVPKLLRSVGVPDGVVAVFSGRTTMKIAGNEVAD
HLEEAGYQTSPVIVKGSTGDDVKKALEALDEIDADVVA AVGGGKVIDVAKVAS YRR
GIPFISVPTSASHDGIASPFASIRREGRPYSEPAQAPLAILADIEVIREAPERLIRAGVG
DVVSNVTAVKDWRLAHLRN EPYSEYASSLSLMAARIVMKNAKPIGKLLPEGIKKL V
40 QALISGGVAMS IAGSSRPCSGSEHLF SHALDVIAERP ALHGEQCGVGTIIMEY LHGG
NWREIRETLETAGAPTTAEDLGVSDEEIEALCRAHKIRPDRY TILGDKGLTREA AER
AAEETGVIQ

<SEQ ID No.:1231;PRT;Methanopyrus kandleri>

45 VAVEKGDFVKIHYTGRVKDTDEVIDTTRKEVAEEHDLN VESGPVVVVVGAGMVWEP
VEEALVGAEPGDELEVEVPPEKAFGERDPSLVRTYRESEFRG SVKPGD TVVSPDG
RRGRVLSVDGGRVRVDFN HPLAGKALVYEVEVDVLED TVERAEG LLETMVPSVD
AELELDGNTLRVRVEGD DAANPAWARAKQRF AKLMIEYDDAVEEVVFEERFTE

50 <SEQ ID No.:1232;PRT;Methanopyrus kandleri>

VPDVRGWPGVRGGVSP EEVFKPTGYHAGPDTPRIVIIENKVVNVQGAEGLELNAEE
EDDTVVAELVKEGYEFDEPIHMCVGPWPPEGVQRIVTRLIVEPEAKIQLMSHCSFP

RARDVVHEMEAEFEIGEGADVKTVDVHYHGEGGVRLKAKYDVSVKPEASFVTEFR
LTEGRVGELEWEMGARVEERATMEGVARLRAVGEDRVRAVESVRLTGEDARTLLD
FKAAAIIDGAFVELVGEISGEADGARGHVECSEIIKGGGKVVSVPKLRVWHPGARLTH
EAALGTVEKKEVETLMSRGLSEEEAVELLVNAMLRG

5

<SEQ ID No.:1233;PRT;Methanopyrus kandleri>
LALLEVKDLRVESEDGTEIVRGASLTVDEGEIVDLIGPNGSGKSTLAKTIVGCSGYEV
VEGEVRFKGRDITDLPMYERARMGLTMSWQEPARFEGTLVGEYLSVCTDDEDWA
RRCLRIVGLDPEEYWDRECGENLSGGERKRVELAAVMAMRPDLVILDEPDAGLDM
SSMEDLAKVIETMREEGSAVLLITHNRDLAEQVGDRAYLMMDGKIVDEGDPKDVVL
KCLMCGGGLVCGAE

10

<SEQ ID No.:1234;PRT;Methanopyrus kandleri>
MPEIEVYEIEPERKLELLREAPSVTEAPAWDAVYPYHRHEEGLFREVVRAVREVLV
ETEAAARVCVGLGMDSTLCAAAAARACEEYGVELVCYTVGFYPGMPREL VHARAY
LVASELDSRYETPVYLYHLDVPPPVESKRELCRLCGRLRFEVAAQAFPGSVILGGAN
FGEAPHRARLDAITHHGQAIERYPLLELGFDDKGHVVAALREVNHFHPRLEWWKNES
GCGVRDYL RDPDPEGVLEAAEANDTFHRILLEGAWCGHHYDTAVVLYDGERVYP
VLIPLPWGWGRDAQRAAEAAFDLADRWEVGNPEEVQEVDPPLESILKRARQLG
TVQPSTSPR

20

<SEQ ID No.:1235;PRT;Methanopyrus kandleri>
LLRRGKSAAEEIAASILRKEGFVARNYRVELEDELVAEIDIVAEKDGERYAVEVKAG
TVGVDAVRQAYVAAKLTGYRPLVMGRRVHPSAEALADHLGVEVREFSEFVEVEPV
DELAADVSDLLQDKMLVLLSAASNVSWE DLYAALQGDLRRVTELVRVRDRSQAEEL
IEALAFKLMASETVGAVKGVGDEFLLELDPRVEVPDGTTLVVLNRWGSPAFVLA
PVSVGTHRARMRSWEGKVETGERVVYLGEVEG

25

<SEQ ID No.:1236;PRT;Methanopyrus kandleri>
VTSFRLRPVFGVPGDDVTRPYLR LAEEDELVRTTREDAAVYAAIGAAEVS GEPAAAL
ATCGPGVAVALAGLACALADRVVLCATGEITERGFQSLVPSMASDGVELTVTDDP
EEAARTLARSEPVLVDPGFDPDGVS AELEGIEPVEPD PEDVERVRGLLEGKRVAIL
VGRGCYRARC GELVERLCEVLEAPIVETMRGRGVVPEYHPRNAGVVGLRGWAND
MVEDADV LALGARLSGRTRADIDWPTTVAVGFGVEDADEVVECDVRAFVEALLED
PPRTEPWNPEPGEPEFDLELYRVVKAALKAWIGPATVD SGQITPTALLAARLSSPS
ELIHSGSFCPMGFAIPAALGASARVPEMALALTGDGGFMVSCQELETAVREDLPIAV
LVTRNGELGFTRQVMEEKEGRAAKMGLDADVLSIVESLGAEVEVIEKPD PGEVKKV
LRDVEMNGETT VVVVELPREDVPMPGSG

35

<SEQ ID No.:1237;PRT;Methanopyrus kandleri>
LTVYKQRFVLDTTAFTDRGVVDELGDGDLCEAVTRLLDLIGRARMELAI SCYIPYPTV
YRELKGFLERNGCPELLSRIDTWIVKKT PNRYEVKVPARLFMAYVKDMRERLDRGR
KRAEKAIWEAALEAYEIMLREEADV PKERIIREVIGETVRRFR RKYRQTVRHGTLDSA
PDL DVLLLAKELDAAVVASDEGIERWARELG LRFMPACSFDP MIEEYLRMSREVEG

45

<SEQ ID No.:1238;PRT;Methanopyrus kandleri>
VREPSRGELEEYREVLEELTGSDLG IADREVTVERIRGPVRADRVFVDGRPVLT VTF
DPWTASCVYTLTPHGAREAEIITGERPERRRLVRRDPYGLLD FEPTGTKRDLEKAV
TRALEECDVG VLELETATERVNGVELTGLAVYTAREFLYVDVVPDPAGRPNPVNA
VARILHAFGG EETRPWIHPEYRFLGVRRIRDGKVARCRLGRELVEFEARITRAGLVL
RPARGD

50

- 5 <SEQ ID No.:1239;PRT;Methanopyrus kandleri>
LDPELKVAVLGGKGGVGKTMLSIALAAELGVPLVDADVTEPDVPAYLELEVEEVLEEI
RARYAVKTDDCVECGRCEVCPWDAVEDPTACDGGCICAACPEDAIEFEPEVLGE
IVRSRNPDLNLEVIHPRSEPWWPELAHVHMRVPERPCVIDCPAGLGCPVIAALSRA
DAAVLVTAPSPAARHDFERARTLVERFGLPTVTVLNRADGSSDDLDDVVIPESEDVLD
AALRRDARALYRALRSHAREIVEELRSEASF
- 10 <SEQ ID No.:1240;PRT;Methanopyrus kandleri>
MWLAVTGGKGGVGKTTVAHVHVRILGWDALDLDVTTPNLHLYLDCEEVERSDVYIP
CPKLEDEDACDLCGTCAVVCAPGALVVGSRWDLPDLCHGCGLCIESCPNGALAY
DRVRIGEVRRYRVSETGATLTSGSLDVGDRRSRHLVHALLEGADDERDLIDTPAG
AGKDVYDVLKAADAAIAVTQPTPAAYHDLRRLMRVADRAGIEVVILINRSDLSDSWR
RRIEEVVRDPVVEAPTVDPPRSEVFREAVERCLEEVV
- 15 <SEQ ID No.:1241;PRT;Methanopyrus kandleri>
LRVAVMVEGDGVSSRFARAPEIRVYEVQDDDELVESTSNPVANLPRGAGRQILTV
LTELNVEATVAARYGPNALQGLKAQGIKAYVAEPGTDPEEAALKAARGELPEE
- 20 <SEQ ID No.:1242;PRT;Methanopyrus kandleri>
LIRRDVKVFRCSRCGEIIEVPYGA PKPSSCPNCGAPAVFIHRLNPGPGTWGSYAGL
GRGMGRGGPGRGGGRGGPGRGGPR
- 25 <SEQ ID No.:1243;PRT;Methanopyrus kandleri>
VFFVHDASECEGCGECMRACPTGALLVSVGYVEVDASKCRACGSCARVCPTGALR
MEPKRG
- 30 <SEQ ID No.:1244;PRT;Methanopyrus kandleri>
MASRRYRYIGPCRCGLGPHAFYEDTETGEIKHAWQVLGEEGAPAPAWPGGWWR
GGWRGGPGWGGGWWWLATADEETRKEVLKAIREFGEDLAEAVEKLAESVSEGP
EGGKTEELEELRKKLEELEKRLREMEKE
- 35 <SEQ ID No.:1245;PRT;Methanopyrus kandleri>
VPTVRDAMTEDVVVGPDEPLERVLRTFASESIHGVPVVEGGRLIGIVTSVDVVRAL
ASGEWRELTAGDVTRKAVTVDPDEDLETALDLMAAVGEDRAVVVEDGEIVGVTVL
DAIRVLLGE
- 40 <SEQ ID No.:1246;PRT;Methanopyrus kandleri>
LKRLFYPEAVAVVGASRDPSKVGHGIFRNLLRDFDGPVYPVNPHADELLGRRCYPS
LLELPERVDLAVIAPARVVPEVVREAGEAGVPYCVVISAGFSEAGNEDLERELVRT
ARKVGVRLVGNCLGIINARIGLNASFAAESPPPGNIAFVTQSGALATSVIDWFSSGD
VGTVGVGFSKFVSLGNAADLDFPDFLEYLAEDDDTDVVVLYLEGVKDGPFRFLDAL
ECAGRKPVIVLKGGRTTEAGAEAVGHTGSLAGSGEVYEGLVEGEGGIFVGGFEEAF
DAAKLLAKAGPPTSDRVLIVTNAGGGGILATDALHELGFELPEPAGDPSVLPPEAAT
GNPVDVLGDADAERYRVALEEFADPDYRGAVMVILTPQSVTEPVKTARAVVEFVEE
45 FPGPVIGVWMGRHSVALGIRVLEEGGVPTFPSPERAARALYHAARWAEVL
- 50 <SEQ ID No.:1247;PRT;Methanopyrus kandleri>
VGGAVKTLLEVPEGRTVRVVDVAAGKGAAAMLYELGIRPGARVEVVKSGPGPVIVR
VGGAKYSLGRGLAAKVIVVEEQG
- <SEQ ID No.:1248;PRT;Methanopyrus kandleri>

- 5 MRTVALAGPPNVGKTTIMSRVCRANLEVGNWPGVTVRKTCTYEFRGDRYRLIDL
GTYSLTAFSEDQQRVARDYLLGRTDGKPDVAVVVGDALNVAGAVRVFLEIAELGYHH
VILAVNMLDEAERAGIGIDLKRLERELGVPVVGISAKRGYGIEHLKRAIADVQGRVE
PNPRSPRYPREVERAVKELAPEVGERLPEYPPRWAVLKLLEGDPPELLRELEKRDPE
10 LLKRVKEVKKRIAERTSHDPAVLISQARDELATRIARNCVTGRPSLSRQDRIDRVLTH
PVWGTIALGVLGTVFASAFLLGDPLSELVEGAFAHLAGFARSLPAPWSDLLAEGVI
PGVGTVLAMYPPYFVFMLLLLTVLEDAGYTARLAALASGLLARFGLHGKTVFPAVLSL
SCNVPITASRIIEDERARLLTAIVVPLIPCGARLEVITFLTAKLPDPWRVPAAVSIYVV
ALSIFVATSYILHRLLFGKPEPHRGHVIELPRLRKPHLRTVLTVTWLSNEFLQKAGT
15 IILAASVLLWVATRYPEPLGTGGSAILVKGALPVTVALLGLDWKGAVALLNGIVAK
EIVISTLAMLHAHLTPENAYVLTLSALYIPCAATIGAVYSETGSMRYAALSVAANLSL
ATLVGAHVHALVALGG
- 20 <SEQ ID No.:1249;PRT;Methanopyrus kandleri>
MPGLEEHLERWFKNESEAVTVYRTLGLAEAEAGMSEVAETFRKIADEELRHAAIVA
RIAGKLSIEDIRAEVERLAEREAQAELRRNVIEEYGDSESDVRAYLISTAHDEERH
TKMLRNLLKRLE
- 25 <SEQ ID No.:1250;PRT;Methanopyrus kandleri>
LRVVLAAVLGGLAVLSPAAAAGTLDVKDVQYPAEVNACQEMEVKFKVVDASTGEPV
SDASVIVRIAGEEHKDTPPENWERGHYAKVTSSEGNVTAKLTAPGKEGTYVWV
KVEKDGYESLTKNLGELKVTGSSTCPNEGEQHRWGEQTGGMADVPVSPVLVILGAL
CVLALAGATTR
- 30 <SEQ ID No.:1251;PRT;Methanopyrus kandleri>
LKELMSSPRGDPEFPLRAEPLAPVYVVRTQFLKDVGDGGRVDHLHPSEAAALEYLI
ALGHDLDPFDVERDSRPMELGSLSPAVEDLRDVGLPVVPSTVRPPDASWAAAILT
YLLEEVPIAYGPKRTVLSFSAVYRTPVEHRPMRTAPDVEVDHECVVQTDSDRYVYV
HCTRYGVAARRDVFDSDACGVLATTVDHSPPPEDAGPSEVADHVLTERPVLAA
VDSEHLNPEHATGTVPFVAVEEGWMEDWKEGVEHDLPADGIGLASYLATLTLRD
35 RLPVYHRDKDGSFKEWLREHEREIIGRARPEEIDPVVEIAQKLEGCELDLKTPEDDL
HRLFDLRRRR
- 40 <SEQ ID No.:1252;PRT;Methanopyrus kandleri>
LVGSHAHIPHPDVERIRTLRVLREVYRRGRKPSLEVYRTVNGSTCGPYVARW
RRDSRFKHGRTLYLGKSENEVSFVEWLVS�DRGEVLELARHLMNRNLSVLKTLT
EVSDLPYKKVRRVLARGLALAFDARPAGSPGIRDVLEELPDRLESFVIRTLGGWPAH
YSSYLESSVRAGDSSTGGTRYPTWSWNSSAGSCGTAGDASKSVHVLSSSTNAHVDI
V
- 45 <SEQ ID No.:1253;PRT;Methanopyrus kandleri>
VRIPILLVSLTVAAIGAQAALDLYPYEVIRIGTDAIGPPVLHATRDGLSVYYPTKGGTW
VGVSLDRDLRVRGVALDAVPVRERDLPTGRGSYYRALEVNGEVLVDDLDGVYR
DAGRSPNVTRPRWKPLTCVAYVGRDGRIRAVTIGSGGEVTAFDLNVRGEDPVALID
DETALACYRSGGDVYLAVLGTEWSVLERGPECVLLHREGDRWVEVLRWYLPERR
HYDHLIEAPHERLVVGRVVELLGREVWTFPLPLSPLIDRSTGRILGWRVGSVPVLES
DGEIEVVTGDGRTTVGECELLSAVDLWGHLLVLRTPDGRIEFELVEFRLYGPPEV
RDLKPEVIRLGDRTLYLATAGVEPVTTILVFDPGTRRLYTYGKDYRVEGELEVT
PWGRTLRYVYDPELGPVPPVLVRDGTVLWNGGGFEEVLTTSGPEDVLPLDDTGIL
50 LISRTGSYLVDLGRDRPEVLPVDAVWNDYGSCSHCGVIVAVREGDAVRVITPLGTF
ELPDAREALWLNDRLVVYEGKDGALHVVTHDGRRALGEAEDA EVVARVGPFFVLR
ERGTYELLARLTDGLCVGLPLPEVRGHEIVYRVGDRECPIDLEDLLPERQVPDRWY

VVEDLALGDLPAWCRPAGDGTCTRVLRDGDIEIVVELSTGFGPVRVRTGLTGDPVIA
GLNRSLLTVVYRAPDGTAAHALLSPTPIVGRYTDKGLEVVRLGPDGPERVDLLPPAE
RETLSLLVVSTVPEYACATRVKVGDRTYLLSGSLYDAEGRALDHRPGSTPGCAG
ETVVVPAPIFSSLRYYPVATVPALLVGSREPPSGDRIELDGVTVLVHREGDVTULT
5 FVRDGRSVDLVLPLPRGDWRVERVSGRALRLSTPDGFELELVTDWPWPTPTVRVR
TGPTREVERWDGDGYRPALTLRVSPPEVNVALLSNCDVAADVGRVLVFLSGKVWR
DVGTLRSVAVWSSDDSTVLLERVAADFRTREVRVLTLPGRFVRVVPTELGC DGEP
VTLIVTEGTVVALTGSSRVLEPEYLRRLDGGWFLAVFDIDGEYLVVLSDGKKVDDR
10 LYDSVEPRPDGTLVARTPAGEEVVLRVERTGDGWTLTEGRPDERKGGGRTRRIPV
PVPPVPVRRRRSA

<SEQ ID No.:1254;PRT;Methanopyrus kandleri>
VSGDYELLHKRRERVQRLRVERHEPAHTDPRRLGGAGLAVRPSILPVTTV

15 <SEQ ID No.:1255;PRT;Methanopyrus kandleri>
LRVMLDTNVVLRAVEELLSPSIPEVTRPVLISEGGRGVRRRLIGLKPSSREQRVESLY
TFTFSLGCLDVTLVWGPRLMKEYEKNLAGESFFNRCWNLRGVQLLEECKWVDP
DEELVELCRKAHPKDDPADAEHAAVCLQTKAVLVTLDVSHFSQMAEELRREGLALK
WRTPFDFLQELGVFKCRG

20 <SEQ ID No.:1256;PRT;Methanopyrus kandleri>
LDKSSLYGLALDVTTLAVLRVLKRYPASGKGFPEGKNSVELVLGEAKDLFRRFELEV
LAGERELLEACFEVLRPLPGVPVKVGGACGKAGLETLRKVFTDPDASVLFITSYGLDE
FEEVMEELGVDPEEIRAECRLLVQEVVEYGRVHPSEEVIESWVEAGFEVRVVGRE
25 KFEKKGVHFEVCYTDNVMAITSANMTTAGLERLRECSLVVPLVMDVKAPVALLEY
EPLGFAAVVGANVHAGVLHEFLTRSDRVYDRSSYRNFEYEEYGGYLPECEGLRHL
YREL RAGLEWYLREGCPEMLWWVEPEPQTMPDVTPNLNLYI

30 <SEQ ID No.:1257;PRT;Methanopyrus kandleri>
VGKYVIVFREPAEPIYWRKWLAAVKCYRENKECRDYIHKEIGIHKDKVVSQNDIET
KILVEAFIKTDENIKQGDINTILVALLNQSLELMKYIAERLMWLGIIWKKGEGYYVIL
NPNDAKKVRRCVYKSHNVIDILDHLKKTLDIDGIAEKLCDDEYSNNCRLSELADEIS
KFIKKYCNILEKMEDAYYDKYSDNIEKGELWYSKNDVDKAIEVVEKFDRSIVSLAIDV
SAHIPGILTDMKWILSEIRKAGCVPENEIKKKALDKRKVNEKELQEINF AVENSWIER
35 KD GELKWMKNQI

40 <SEQ ID No.:1258;PRT;Methanopyrus kandleri>
LGIQRLAHNSPYSHHRGVKCSGDGGVLLRPADSWAGVLVD TGSTIVAVDAGPNPW
HAEDTDYLLLTHAHL DHVASLDRYSRNGAKVLC PGDVRDDLGLVDSAVGVKKVKS
MLYDVIVHIPVEHTCSAYAYVLDLEECNVLVTDGWHVGPRTIDGEIKPLWKAVREV
VGGE GVDVIVSEATRALVDAPELGGNERVFEYALSLHDP RDVLAF LQPTDLEIIDTAF
RVASDLGLDVVDSETDRKLKFLERRGDVWEYDVADEPLVRSLYLTVSWEKARE
LAEAGLVEAVVGNWATVHHLRRRVGVKYAYVIPRSGHASRPEITRLITELEPSCLVF
RHRSGDATRLERYYSRFVDEV RVWVGRGCRDESLELPP

45 <SEQ ID No.:1259;PRT;Methanopyrus kandleri>
VPTRDRKIDERFPARDVTDEVAREMPITGRPPLQYIHVWWARRPLSASRAAVLTTL
VPVDADEDELLEILHVGEDQASWKYTPVTGSHADTSSKGADLRQFIPGDARDEGH
GVTLRRMYREATGSERPLVDP MAGGGSIPFEALRLGCRV VAGELNPVAVLVLKA
50 TLEYPVEYGGELLEKMRGFFAEIRKELEQRVGEFYGDNDRAYVWIKWIECPRCGLK
VPTRPNWWLLRKRKGKPEESLVLPDVPEEGEGNEVGFDVVRYSEAREDGFDPGRG
TVSRGAVTCPRCGTTIQREQVHRLSRRHFEDEHGFV RAYLAAIVEGSGRGKEYRAA

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TDRDLEFFERAREELFERWDELVAEDLIPTEEIPEGEKTRERPLRGIDSFYKLFNER
 QLLVHAELLRVIRELSGGLDDEYREPLTVYAMIAFDKMINYNTICSRWEYTRGVVKGI
 FDQHAYSWAWDYGEMNVLAEDGGWYWAAPNVLKAFRQISQALSGVDGDVEVILG
 DARALPQHRLNLGVESVDAIVDPPYYDNVQYAEADFFYVWLKRLFGHPTFLVTIS
 5 RSSPESAMEFQRAFSNELTPKDEEIVANRTRHDDPEREYERGLREFLEACREVLPE
 HGRLTLMFTHKATEAWTSLVRALRDAGFEITEVWPV RTESEHSLHQRWKA AVGTT
 QIIACRPRSGSEVTTWRRVRDEVRRNVREAFRRAADLVFSDAERLVVARGAALRPY
 TRYDKVLRSGDEEVEVSPEEVMEEAYRAVPEAIADQFEETIGETPGFEDLDEAGR
 FYFLYRFFWGYPKPESEAPDYEDVLM LAHATDFPLNKYEYRRRPDAKGKLV RVSS T
 10 RDRGTVAILDDEFESRKPGRVNNQVDALHAVLTALTREGDELDMRTALEVA FEHEEL
 FEPIARALARLREYRL EEVEDEGELDERYPELK Y AALVLK KMREV KQRRRLGG

<SEQ ID No.:1260;PRT;Methanopyrus kandleri>
 LSGGDLPSVFDVFEPTTEHAINRNKNVLSVELSHVEREGTPESDPEKFLALTVPTEGL
 15 VNTVVSALKRVAGLEGGE PVQY MTERYGGGKTHVLVTL YHLATSERARELLERAR
 GYVDERRLEELEEVL SALEGKDVRV VLDGDSVSEPRWWV ELAERVDP ELAE EWR
 SRDMTPSKGDVEELLDRALDGV DGVLLLLDEV TGM LIRSGEEMDRGLEFLKILARV V
 GKADAPVAMVVSAPKGS GEVQRQLERLKEEGEVESEAVLREEVHDV GEEAVEQLD
 RVGEERIPVSDVEEAAEIAKVWLLRPREDVDVEEAREAVVEAYEELTSELAGTEGIP
 20 RDEANAVRRLRETYPFHPRLLEVLR SVTREETPYQLTRSYLEILMQVVG YAFDRWK
 EGWEAPVFDLGDVFLDETEVEEAVVKPEGWEEPAGDLREKLDLVEKEGELARR
 LAYALFVRSLVPDSRKRGATPKDLLDVARPGEGVELSDVERALEPMEDTLFYLRH
 EGERYYFDRTMNVSSVIQSYMPREERVGNWRAREELERELRSIGGLGRDALVLWE
 DEEELLNKLREP KPRVVLP PWEGEERAEELWEKAEMENAPVFLVFQDKGRERRL
 25 LNAALRLSAVERALRSDDKLAREHGKELRRKEEYRNRVRKLLREGY TILRYPSEG
 GLAREMFSVEEGRSLG SALGEKLEEIGFLEPGEEP GDVRVGGVGGGEARGDDA

<SEQ ID No.:1261;PRT;Methanopyrus kandleri>
 MLEERELEELAKALRGELDKTGAVLGLLYLAYVETGGHGGMTADDVVRVLQESG
 30 YDITKERFYSLASQLMKKG YIESHKINGRRVIYTINSDSEYEVEQKLRRERLEKSAPTA
 ERVSAEEMRRILDRHST

<SEQ ID No.:1262;PRT;Methanopyrus kandleri>
 LAKVSKVFVVGFTARKGGTGKTTCSFNVGFEFARRRKWKGVKSHPVFFVDVDPQA
 35 IGKESERAATTLTDLFRIGPFDLTPLKLEGDRMVEARRVTKETVERTGGFELFHVKY
 SPDPEEFDNADPMCSVHDKVFLAHLSTHISESPGMMDFGKFLNAITGAGFDGIVVL
 DTPPLNVRTTFVLNALEHCDLVVPVLNPESYDQIPDFIRRHVPVRFIVLNQMLKGRTKE
 AEKIRREIEGYLKRTTLDEDDVIWIPSNQDLRSCTNTGVPARCRNPKPQAVTPKFHHI
 40 AWRIEVERERRSKISEIRL

<SEQ ID No.:1263;PRT;Methanopyrus kandleri>
 VFELAVKAFGLPDSTVTHAKRGLQIMDDRASGRKPVTRGDYGVK VTRGVARLV RH
 AHTTLVVPGLDVVTKWAKRYGKRPWKIVRVNLEDGGGLLDETPLRFEDLPPGA API
 45 AAVVRTGNARKVVEEAFLTEYPLFAAMMCVLEDAARTMLERFSEEEVETYGEFCR
 KHPGRHGSSFLIGVALWGWLEERTGETIDVDET LRSIEKLARDPVEEAVNGILDVG

<SEQ ID No.:1264;PRT;Methanopyrus kandleri>
 VDAEHWEVPIVPKPEFREALQRYMISRL EEVGVGPKTVEQIVNLNIEKVEPWNDIKS
 KITYEIQYNLKHCCCMVEDLKKDLKRIYGELRLEDLCSFGDAALWLLGVRRAVVEFIH
 50 DLLLERPDLT KAVDLWL VGRMLDAGELKAATELLELNGYEVPPSPTRVPELKTTERV
 HRLGHVMTETILTAHALSNRVDSSSFDEAVGKVRNWFKEAQSSLRNEVQKEDSSEL
 VVKFIEGLRDTLEDLIRKTLEHGKPELEEVNSTFELLGIDDLGSFFSRACGEFKRAVD

YLVEVVEFDPMGRMAKNLLRASPEIELGDRTLEPEVYDPRWSIFERDLSELDRITKEMI
 EELVTETDRSSSEREAPPTHCPRSWTPSSRRRLTNAEGTLEPSPTPYRSMTPRISP
 SDPVGKRSPLEPRPNSPTAAHALVGTLDTVLPTTLRPGSRPSATSHGAVGVEGTP
 GRRAGGVAVGTTGKLGRGRRLDRARVRLQARGERVARERPRDGHGPARPR
 5 PVPGHAAVGRRYHRGGGPAGGRAGRGGPARLRR

<SEQ ID No.:1265;PRT;Methanopyrus kandleri>
 VHPTRPFHGKFLRVLPGEPELSIAFSWNLSRTAADAGSLESVLERREERGETFE
 EFVGRRLREDGWLVGRLRREGGKSRVLEDVRKFRFPCSGPREVRVRGVLSG
 10 TVSVTELVLDDGSREVTLVLDRLRESFEDVESVTEVVEGEFRRVQDGELESDV
 VRYGIVRAVRDVVEELVERGEAEYEVAVRAETVNGDEAGVLADEWRFPNAKAAL
 RSLVREILRTRLREVLEELVES

<SEQ ID No.:1266;PRT;Methanopyrus kandleri>
 VSPGGVPVPERVPLSPTEEFYDRVKSVERRMSDLGLEPPEDNESLLYDEKYGHF
 WTFNGFGRELWSDLSAVWILVLPNSGLLENIFELEEQPSTGKVLREVERVGRGL
 LERESKRHFSDYFLGELEVFEASQHVKRFLDEPNFEVAVNLWIAGAALASQDGT
 PRIAIAISSIDTEVSEFPVGVPSYPLGYILQGCGITASVLCCTAHAMVNRGVEEDQLL
 EYLSDTPTYGEKVRIICASWVEGTYKEVIKECLEGLKDGLNRLLRKGRGLNMRDLGID
 20 DPEEFAHEVLRKLADVIANISAVFETVHREPERIVHTLLSVDEEIRLGDKIIPPEEYDP
 NGTNMYRLEKTFESIDAELKFVEDAMKTVGKLVGSGKEDVAETATKLATEAVKQGL
 NIIESGGDRKGRSTLGELIESVVKEVMGDDRKRK

<SEQ ID No.:1267;PRT;Methanopyrus kandleri>
 VPECVPLSPTDRFYDKVKSIVRHRMSDLGLRIGDAALYDTKYGPLSPLIFMDGWW
 25 RGSWIRERRLDWGKLDKPWLLTVSVLAELFDSNPEEIAGIPSIEIEPGASKLGYMLR
 KMIKTGEESLKEKREYGHLSYILWALEVIEVITRRIRDVLVDKPSLETALNFWVIGAV
 LSSRNVSQVTVISDSVDLEIPKSSVEIPLPYGINIQGSSSITSTLYVIAHAMVHRGIDED
 QLEHFNIQTVCALWIEENMHKKMIKKGLEELKHGFEKLLKKSKWELELEDLGIDDP
 30 EAFHEVSKKLAIEVTNVSTAFETIQDKPEEIARNLLSVDEEIRLGDEVIPPEEYDPKW
 RQSQRVKQHVKGTLSEIDTEKLAEDALKTVGRLVGGSKGEEMAETAACKLATEVVKR
 GLDMVSESSGNRKERSVLGELIEAVVKEVMGDKARKK

<SEQ ID No.:1268;PRT;Methanopyrus kandleri>
 MLPALLALAVLLALPGARALDLYPVEVVEVGTDVAGPPVISWDYPFERGPTVTVPSD
 35 GGWVRVRLDGLRAREVVFDAAPPDLRGIAYLALERDGRVIAVDYLNRRVLEDRGA
 HPTVPTVSRSDSGAVVAYVRDGRRLAVLLGEEASVPLEHLRGEDPFVLVREGTVL
 VAYRSGGDVHLAVMGTEWSVRVRGSECVLLHREGDRWAEVLRWYTPERLTDADL
 LDLLKGRAPEERVVCGVPVELGSRTVWVFPLPLAPVVDAGTGAVVGWWSHAGLEP
 40 RELIGTVEEDGDVLVFTGWWEGLHASVAPAARLSGSRAIPGSLGLVGCERVMMAVAF
 RDPDGHVRVAVPGGVRVAPTVPVETVDLGPGEPLAFLEGLVFYRTPGGDVRCA
 AVRPEGGPFVRPVVEVPVRRWEVGGKELLVAGSVVLDPGTGRAYVLPSESRGEP
 VYRRDLSDGWFVAVFRFDDGFVVVLSDGRSVRESREYRSVTRRRRG

<SEQ ID No.:1269;PRT;Methanopyrus kandleri>
 VAHWRNSRHERGRTLYLGKSENEVSFIEYLVSLNRAEVLELARHLMRNLRSLVKS
 45 LLPQVSSLPYKKARRVLARGLALAFDARPAESPRIRDLEELPDRLSEFFMRTLGGW
 PAYYFSLRKYVRSRRGSLDEKHEIPDVKLERWKFR

<SEQ ID No.:1270;PRT;Methanopyrus kandleri>
 VDTGAVDDGMIVVRSYRTLDSEPTWSMSYRVVRYDLVTSRVLVPSGGPSES
 50 RSDPRMYPGAFYDPDRDRLLVITYHPRLVLPGGDETGPVLVSEISGASRDPRFVGC

RTLTTTPNDADDVKPVLPEVIDGKPYLVYVEPGEPFEEGGTREYRLVRLDLETGAR
EVLAIEFGERTRVAGEPRTLHRLGGSVLPRLRARLGRGRAGVRRSSRPSQAARGL
DGQVLRVPATVRRRPDGRVRPRRLDRSEPDRTRSTETRRLLDRDRVAVPTTLGRP
ALPVDRSQVHGDGVDRGLLGRATVRAGPGVQGDPRRR

5 <SEQ ID No.:1271;PRT;Methanopyrus kandleri>
VIVLNNGTVIIVHLDENLKADAYRLSEFGRLLGHRATGNGVILLYRTRGGSTNVAVVR
PSGVTYASKLGESGDLVYRTADGVVTVVGNRIAPPRGEVVRVGAEGGVISVLRD
10 GVLLGFDRDGRVIWASKIPDFEKYLDYSWSPADPRKVLLSYRDTSGLVVISVDSVS
GDVKSPKYTVTTLDENTAFVDDGTAVTVLKNEGWWIRTYDLGGVPIHADKGVIVYR
DRFGTLHVAILAEREYLRPALEATGLAVFKREGEFMAVRYDESGRILGLDCEVHRER
TDGGAVVLLTGGEVVRDLTSGRVEWVRTLPDFKGYLDYRGTLYRDTSGRVRAVL
ATEGGVVEGLKSRETDETFEFTFPDGTSVVIGKDGRIRETHPGGTTRGGVSGRGE
15 QGEQQGNLEGKGNREQGQRQGGPNQGGNQGSSGQSGQNQSNQGGGQQQG
NQGGQQGGGEQNQRQGGQPEEHEQGEQQGHGQRGPEQRGNQNRNQGNRNR
QSGGEGGKRGSPVLIPVPRRRRVHTQHAL

20 <SEQ ID No.:1272;PRT;Methanopyrus kandleri>
VDVLPLSFECRISQTEWRQNGDEAIVRGTVTVDHLTPPGSPNTVHWVAVTRDWSG
AEVVLGEGSTEFPGGLLVPCSVDFRTARGPAAILRTGFDVRVSVGYFEHLGGTVGYE
TAPVILPLTPRVLTVDDVEVTKTVESGGTKELAVTVRFTPPDGSFTLDRVDVVRDKS
GNIVGERTLDSPIPENDSITVDVLLDDDVSRAVEVTLAGRGGQIRYQVTRYEKV
GDLSVGLGADLRVENGSLEGAVEVGIVPTEGTLKVTCDGQPLPISIDGGALSAQP
QRLKEGAHRVSLVIPARTHEVSFEFTSPTGRVVKRYEWRI PVGFAEDPVVYQVGF
25 HGTGEATLYVSSRVDDGVLRIPYDGGVYEEKFEYSRELWNQGVAKLRSDAELVR
VSPEDPYGSLDVKLVLLELDGVTVERELTVPYTRYSYTVGGYVIDVYPKVDDGFEV
DVWRSETTGAVRVPAGEGSPDVERIGVRPTEPGTITGDNTRTIPLYGDRVVLVL
APCQDGTSLAFDREHGDVVALEVDPRDAVRELVRVYRTELS

30 <SEQ ID No.:1273;PRT;Methanopyrus kandleri>
VVPAARRAIPTLVSLASLVVLTVPVSGEEYALRDHGSGLTTWVFDYDPNTMGSQLP
SNWKDYLVWGKPTSVALGFELTANNCTSYFDSFPAHDIVGRLTAQGFDVTSVDYAE
ANGPVSSPDDLNNATNRRGTPLTPAGLSLRVTDGTSTYYLIPCYGGPDRVPYYLDE
DSWPAKGERTVIWVPTTSGPVFPFLRGADPNALLVVERPGSERLDLDGDGNPDV
35 DLGLASLSMVMMLALTIRTVTDYLLVQGPDLYYEVSPDEHLLNVASFRASDVEF
SDDGTMKLKLHIGVEKGTSVLEGVDLAFLDRDGTALNVTPSEGDLENELLSLKSA
LSWDSSEITLSHPSGDIREHLPAITLRVMGSTELTDNLGNTSQFTVMASGRWTSYH

40 <SEQ ID No.:1274;PRT;Methanopyrus kandleri>
LLLRLDPWCGVVVDYGDTRVFDVTDKGPYVKRADAVIVTHPHRDHYGGVPR
EFGELRADEVTAALLGMEDEAEPLRSSFEAGLLDVRTYPVNHMC PKAHAVLLSGDA
RVLITGDWCALGEHPPLWELVDDEVDIVTECTRAASVHPDDPEAAEYRIQRLLH
REDRTVLLLTHVNPLIDVASEVEILHVLEGPVDEAVKAGAHEGADLEVSRPEYPL
45 VTSSVGTVEGLSKRPHVLITERWFLYRDREGRLRLLDAVPYPYIVSGTGHASAAEL
VRLVEELEPEYLVLRHGSPDGVRLRKRLAGAGLDVRVEAWIGRRGGKLELP

50 <SEQ ID No.:1275;PRT;Methanopyrus kandleri>
MPFALRVGEAFVGEPEDEPIAHIDLVMGSVEGPVGRAFAEALASPSKGHTPLAVLT
PGVAVRPPTLITPTVTIENMAQGEKIFGPVQRGIAEAVVESVEEGIIIPRDI VDDVIAN
TFVHPEAEDDRRLYENNKEAMKKAIECAMKGTEPTIDELIEKKDEVEHPLAKF

<SEQ ID No.:1276;PRT;Methanopyrus kandleri>

VVATVRPVRALPGSSTWVRLSSECIWVRGPDGTVRVRPEDVVSVKEHRSSRPRMD
PDEEVRVLITRDLEHVLPFRSRKLYRGVKAILAARDGDVDRLLRHLRRVLRKERK
PPLFERREDGWLRWPWLEVRVGPPEARRRVRELLEYWLRLLKESGRDPEDVS
PRKVGLSVVLGSLILFGGGKGGKGAAGAKVKAGAKGDAGGKTGGTALAKASKLL
5 LKMIKALMKLGKVTFTWTLVAFVVAVALVPLAVMSVYVWLIARRAYRWGSPWLGR
LVLLQLQGFAVLTGFWCLFAPLPVLFHFLAGPFVAGAAALVPPSLLLVRAYRREP
LRFPVAVHTTGSDVTRPLTLAGVGRAGGGAVRGARLGRPVRRGGRPLAGARLR
RTGPDDPARVEAGPAPVAAPGGRPDRMNGLDRSVGWGTWTEPVTQLARRGDRY
FFSPFDSR

10 <SEQ ID No.:1277;PRT;Methanopyrus kandleri>
VFPPCRIMHVVLWSALWSLLWVILLAVYRRSGRPSNRWISTIAGRWFQDLRSRV
KEVLEAVETAELVDTTFEGKGAPPELDRRLADVLRVPDREVDWRTGLGIEYLKGS
AGDRFALELALLETGSEEAVRELVEDGYDVLFPDVRLEGPTGTVSARGVVPLGRS
15 DGTPVAVVGVGRRGTGRIEVPDSELFVFGGLVSSRRTFSSVLRTFGELLPRGHAD
RRGARHCPRPPGGGGGAREPG

<SEQ ID No.:1278;PRT;Methanopyrus kandleri>
VRLHVLLTLGDVSNYRKPEPWLVEVSLRLTGESPEDTLEWTVEGRKVEVVETS
20 DRELGTALLALHDGDFVEPGEAVVSTGIIIEDEKREKYEEKVREPLEDLEYGVE
EHTDARLTEPEGLVDRVCEVTELLRTGDAVFLDLTHGARVMPFASALGLVPALRAL
TFRRAVLGDDGSLWERVAFSYCISGKEVEGVVEGDRWLVDVTDHVLAWRIRD
VATYLADPSPRWVDEAEEALRTIRSEPVEWVETLREFARVERASSPGPVHEFVREE
DVPDRDSLVELVWGTLLRVFLGDVEPREPARRTVSEGPLTPEERRELAARLSEVR
25 DFLRDYCRYMLDRGRVAEAAASLMNETHLLRAFAKLVEPFLNEGAYKRARLKRSDG
ELRRKLKELAAATLDELYFKLFDPFGLPAARGAIRRILGELGEDVGESTETWESWS
RSGELLRSVLGGGLPLKRDLEERLGDADFRRDPRRLRELAELSGTDDPTALEKPPIR
RIRNKLQHGDVPVSDRREVHRRLLVELCRAHLEGLTLPLIELLTETVEGRTRGDGP
GS

30 <SEQ ID No.:1279;PRT;Methanopyrus kandleri>
LVLPLVTAILLTAAPAAAGLQFEAPTAGYPVPEPPHLEDGDGHVEPPFRYAGDHRVVR
YPCSVPTAWVFLEDRRCVIAVKPVGGGHPVLLLDVSDLVVSVGADGVRLRGGYA
TAVRMEPVDFPSLWIPYEVVTGSGVELLFPWLLGPVRECSRTEFERVAELIAGERG
35 TPPEDVETGVWDELRPSPPLPVPVAVLFVPPARKRRSAR

<SEQ ID No.:1280;PRT;Methanopyrus kandleri>
LGIDYTTERVIIHRQRLPEILEDRIIEKYGLDKVQESDHHWRKVSEPALSVTRKLVPR
IDA

40 <SEQ ID No.:1281;PRT;Methanopyrus kandleri>
VGVPPTSWYHVIHVLAILVVLIAISQFLGTLIITRRSRRLRSKAERILEIVEKAEESDAV
FRGEGTAEELDRELSSELLKIPDTSVALRFGIAMMNWETKGREDALEALRLIDSES
LEAFEPYLIPFDVRLRTTHVRMSTWNIRGLIVPLGWSVQRSKRRGRPIAPERTTRD
45 RPLRGMSLGFGRHRSRGPETPRVRVRWDYRK

<SEQ ID No.:1282;PRT;Methanopyrus kandleri>
VPDPTLTLLLVALQHPTHGDCSAVLVRTHGGYAVAYRRDATYRATLHLEVTTWAGR
GALREYKLRNGRFCHTVITEDGWVITIGGADDESVMNRGLEELGERVVLAGEVTEWD
50 LERALDLLRRIGIGHFLVGSPDGTGVAVYRYGRTLLEVLRLAEGEYVLVPNDPRYY
DRGRFEDYDTPVRAAAEIAGLDPYGVNRRDVLVYLVEPRDGRATVRVWVAYDGG

ALLGRRGAGPDPVEFMGCYVPAEWIPRLPDLFELGTVTLGRMPMPTRAPEGNSRSA
GSPVWWPVPVPAGRPGGSRWRRATDDLHARDPTTEGVRRVGTAVDP

- 5 <SEQ ID No.:1283;PRT;Methanopyrus kandleri>
LRSSGVLITHLLLFSLTLPPIAHSTPVLHGDTATDCLEALTRLSHEARHLDSYHLVLIG
SPPYRYLTVLPNAGLVTDDPSTNASLHGRELGVRTPFGEVRTTLRAPAVILGLVNLE
DTDVDPSYVTVLWNRVAFLLTYSVVFARLES DGRIELERQAWFDKYRDVLPVYRP
RADYCEYRFDTRDGTVEVKFYDLWGRTLVTVRANLG DENATFDETTADPETLEEIE
10 SKLAHLPERLREYWSFLLVRTPEGVEPVAITIDPLELAPDSHLAEFLRTLNLADRLQL
SSPLSLAPALLALTARLYAAVGLSVEIRWGRDDVFERLYDEVWSALPVAACWNLLY
PLVSNAILKSIVERLRSFGLPAIVPCCVSVAVWEWVTENAVFPVLERWYWGTVSM
GMAPVVEEPFKRLVAVEFGIPRIVSGAVYGLLEGLWHWVSGIETGPLLSILLDKAAT
HALLTVLPLPLAMELHSRTFGIIGTTAFQDSIHLLNGIITGVLTGDVPTILDLLYYTALS
VILENTFGIPVTPGL
- 15 <SEQ ID No.:1284;PRT;Methanopyrus kandleri>
VAPSGSYEEARSLWERAGEALELARFSLEEGMYRWTA FHAEQAVRLGIKAALAFLT
GEYPRVRGLSELLGVLVDVTGDRRVRELAGELREELKMLSDAYTAARYRVEFPYDT
REDAERFIETAERVLSTLGELLREHGFEV
- 20 <SEQ ID No.:1285;PRT;Methanopyrus kandleri>
VSRGDPDPDWYVKYLRRRYRLFLEYVRRWRYWVRRIA EVIRERVDPRAEVIVFGSVV
KGRATGGSDVDVLVTERARELRPHEVAGIVEEELDLPEDHPFEFHLTTPEGFETR
WRRFLDEYERVG
- 25 <SEQ ID No.:1286;PRT;Methanopyrus kandleri>
VCSARSSRRSSPCGPRSPTAGRSPGVHLGEWTELTVTGSTVQAHLIVGIRGYGL
EGSFEPVPIKVLVPSDAELVTAKWKPKGGGEVEVEPVSVRTVTWPGD TDQIGYLLRY
RSEDPLGALFPDGVIRWRELTFVLPVEAKGSESSRCLFDVFKGEYLGTL DVTVTARL
30 HRGKGEEGEAWFFAWPIPESPNPAYDVKVHGLYVDFVTVYDPETGRWRWFIPVIQ
PKDRSSTYVYVRVDVAGPVFTFGVETDHVSVETVYPWDERASQFLSLTQYLPVLV
MKKELQRGEANGETASPGRGGGGAGSTRTGRTVPLIVPIVVRRR
- 35 <SEQ ID No.:1287;PRT;Methanopyrus kandleri>
VERIRALRVLREYVRRGKKPGLEVYRTVSGNTCGPYVARWR RDSRFKHGRTLY
LGKPENGSVRFVEWLVS LDREEVLELARHLMRNLRSVLKTL LTEVSGLPYKQARRV
LARGLALAFDARPSES PRIRDVLEELPDRLESFTVRTLG GWPAHYSSHLKRVIRSRR
RSLDGKHEVPDVGLELQRWKL RHG
- 40 <SEQ ID No.:1288;PRT;Methanopyrus kandleri>
LLPYLVGLVLALAPASGEPLIQGSLSKDL DYLHEYFQKQVLPKWRDEPHVIADHPA
RRFCYLP GKDFVTGAPEVRVEPGSIRMEVQLGRR IIVARDVQGPV VVPGVSY
YKVMALAGQYVCEVGEVILAGRPPRFAAVLKRDDQVIAREDLGELFLADVEYVWYS
DRVVMRVLGFRPEGGWSRYREGEPLAITVTFDLGGGRILVDRVKVTD AALVERMR
45 ELSRSLEGPVLGSLVLTGSGVEPLFVDFEPREGDPLVRFI ERVFGMYEQGASEEEL
REVMSEHPNVEFLFPEKGGGTTSGIPVWVLPLLVPVPLAGRRDDA
- 50 <SEQ ID No.:1289;PRT;Methanopyrus kandleri>
LTARKIDSWFPVAAVSDECERERDLGSPVEVLPGFRSPVALARAVVLLSLAPEDTEE
DALLPSLRPIVGEPWRTPIEVPDGDVPRKVVVLGDG SIALEAARMGREVRLVVTDP
AVARFLREVFGRLFALREEALEEEFLHEVGEVLRDRFGDFYGREDRAYLWIKRV
RCPGCGLLVPLMEHRWVVEGRYALELDVPEDGDEVEFEVVEAEEAGPGTVRDRGR

5 VTCPRCGRSRSVEGVRRDLSLRAARREEEEEPVDAYLAVVREDGSVRPATDRDLE
RFELAREEFREEWEVPRGEPPEGLKRWGIWDVSWLFNRRQLLAHVEVAVATSEV
DGDRYGIWAAAVLTLSLRNSVLSRWDPVTVGTLRPRGWTWDHGELPVPSAWRE
VSDEITEACRELVEVAEDVEVEVKADEVNRSWSIPRDLPDVLFRAWSELVSNVSA
10 GVGWVKVPVSGGGWARTRAPLPVVGGLGWDDRVSLILRGDRIAGRWEIVGWIV
GCGLEAASAWPVIGEDALVPLVGREPGPEDVDWEGVVEEVRSVRELLREVRDL
RGRGWRSVRLIPYAAALPPCTGVDVVRDGDLSGVRHPEVLSEVLAVGWRELVEA
VLELLDVGLSDPRARFYAVYRSLWGYPRPDDAPGREVGPPRLALGLDPNDLPYLD
ADGRLKTYRERRESRLRPEEDPVDAFHAALLEVLEDGPGSALEALPEEVRGEVLGL
15 ALAVARAARRRGEDHPEAELARRLVGVSAGAAAR

<SEQ ID No.:1290;PRT;Methanopyrus kandleri>
VPRRGEPVDTEGRLRETIGRYHGVLDTNFAALAKAFVDDICETPDNVVYAFFLE
VKRMMGENFLLYSYEELRAEYAKRLEDLRDYDQGQEVYACPISELLGPTVRGLCY
15 LFKGHEDVSVHDDVLSRPEYSEQLERLYRGLRRGGYAGLPESLRGFKCNFEEGQV
GDKHVDVANVMVAAVKGSVLVTSRDRGIRDACSELKPRCLCVYFNPQYVDDPVREE
FEFELVPRPGGLPVGLRYRKIGKGFTR

20 <SEQ ID No.:1291;PRT;Methanopyrus kandleri>
LVRSHVHIPIPSDPVERIRVLRVLREVRHRRGRKPSLEVITYRTVNGSTCGPYVVARW
RRGSRHRHGRITLYLGKPENESVSFVEWLVSDDKKQVLELARHLMRNLRSVLKTLT
EVSSLPYKRARRVLRGLALTFDARPSSEPRIRDLLEELPDRLESFTVRTLGGWPAH
YSSYLKRVIRSRRKSLNGRHEVPDVQLELERWKLQHWRLRPRTV

25 <SEQ ID No.:1292;PRT;Methanopyrus kandleri>
MRRTGPGAGAVGSVPSWEVVRRLGEAARRVLGEDARVVPFGSVAKGRAVPGSD
LDVMVVSERAPSSFRERARIAYELCEEAGVPEDRVDVLIVRPKDFEVWGRMLMTSE
SDDTRALVEELLERGERFLRSASEEERGWNDLAALHAHQAVELTIKAALIALGEAP
PGTHFLGKLLGRLHRTVGKDAFGELSRRYRWELRELSHAWSEVRYGHYPGEDVD
30 VGELVEVAREVVEAVRDYVLRVLVDVGD

35 <SEQ ID No.:1293;PRT;Methanopyrus kandleri>
VGTSTLNNLARALGKGDLADLDPGDAYRAARNPEAVEEIGEEVLEEALMELVEAD
PKRASAELNTLLRMAERAEREGLEIDSIALIPTKTANCRLCARVVAEYLREEGYAVW
ETEPVRAGVDPGEFWWGLSDLLERLEDVGVTDPSRNWVAATPGFKPEAAVLTLLV
ASLFGKPVFYVHEVMNELVEIPPAMPVVDTPGFVLGLIELRRRLGDGAPEEVAEEVL
NDLARDEEERERYKLFLVEDPRSKNIGPSPLARLAESFLALGLLAAKARNYSVEIRTK
GHTVPVSRGGGVKKVDRLRELPLEDDTLEVLATVAALEGVDDTWVAGEWTE
GTRRHARTVEVLETRDDAVVSVRDRRVHISRLIPTEDPERVARALKQLVGALSDA
40 R

45 <SEQ ID No.:1294;PRT;Methanopyrus kandleri>
LRTLPIALTLLLVPAAAHALQPEVLWKGEFPDCPGSGFVHLVPVENEENTALLVVRT
FERWSLYEVKGSEVTHLGDVDLATPRSTEVGTAMYYPDNRNELLVTAVIEEGEGPG
GGVLAIRVGRDGDARKFDGAYVHARPCPDGTILALLHEGHEYLEDEGVHRHDLAL
IRLYPDGRAERLVTDFVSTLPPSALLIPGTLRIEPLGDDYLITGSDLVSMVELRRTAS
GWDTRYGYPMNLGARITYYLEESTVLDPKRRLVLRQSNLDEPLEGYWAICELVPE
SGLGGPVKLRLRVDLGGDDLYFPQSGVKLEVGGSTYYVPAVGASSTKLLVLGPD
TAHVWEVPGFRELAVTPRLYGARVSERETGGCTVEVCAFKPSRGEELWTLPLFGGT
50 GEKEKKEEHKENEGGKVAIVPVLPAIPFRRPGRA

<SEQ ID No.:1295;PRT;Methanopyrus kandleri>

WO 03/076575

5 VTWVPLVLGLILTATPSAGEPLIRGKASDDIGYLARYFESVVEPKWKSADARIVVDAR
 GFRGRTVDVVYPGLDAFVVPAGGRPRGSVTSVSDVPLSYVECEPGKVRIRLDRV
 GRTVVVEGPAVVVRGLYPPIPLDVSAALVDGYRCTVVGGVQLPIDGGCPLAPRPYVP
 PAAVLEGGGSSDRVVLADGPWPLLDVEYLVGGDVVNMRVQLLEDPLTSALELAIA
 5 VSHRKADVAPLQGVETFDLGS GKIRTRHVAVPWRTGDTSEDGVGTLKGGVVMR
 TADGLEPLLWFEVARDDPMMEFISDVVEAYRRGDFGEVGRMLKAHPNVVFLFPE
 GREGFWVYAPQVPLRRAHRRRIAGTRRRGSP

10 <SEQ ID No.:1296;PRT;Methanopyrus kandleri>
 LENRLWALTVPTRVGTGGRPGAIDLPLIRRRHTRVPYVPGSSVKGALRTHVEAELE
 KPDDLVDLRLDLGEDTEERRERARLVLFGRDRTKGAVTFGDLLPVAVPAPVALEG
 GKTTPLVWLTCYPVLDWIGVEAPEPDGEALAPSGFPAERVVLEHRELVRNGKVD
 GVADELVPGPWKLPLHSRLILDDATFAGLLDPDRPVVTELRTVRVLGGPWDKTV
 EEGALWTEEFLLPQAHPPRGTVRGRRVHAGSDRGARARGPPEGDLGTARRGRFR
 15 LRRPTVELRGGAGMSERSPENVLRLREDVDEELKGDLSLCSVLLYGLPGALV
 LAEREDVREALSRLPLDRIERELEREGLPRADRLATRLADLARNAAVAVGELPEDEGR
 DRVERLRRRVAAEAEESLVPEEGVTRTHPYHEKRTLALRALSDGEEENLRREVRLLR
 RVVDAAEKAARSDEIRGYVGSYLKTLRELGRSPHLRVREVELRFPHSRLVGMGGP
 HPAENDLTLDVPTGLPVIPTTLKGVARAAGELILRGDPDELKRYFGADDTQARK
 20 RFREVFSGSKPRESEPKESDDGNASESKRAGEVTFHDALPDWLRDVSPLVDV
 LNPYGEYYEGEGPPHESMRPKPVEFLTVRGRSRWRTVLVSERRGSLDVALRLK
 YGVERLGIGARTCAGYGYGEVRY

25 <SEQ ID No.:1297;PRT;Methanopyrus kandleri>
 MRYRLRRLAHRPPSSTSSSPTPLLSRTETGEGRRSFPSDGLPPQNSASTRRSPSP
 SRKEAATARNALNCPLSSGGRGSGPSRSLTCEVIAGVAKVHPTVRVLNRGPGP
 PPGIALIKLIQGEWRGAGVSRVPLVTVRLRPSGGIKTWLRGRKLADSLAASWLLGY
 LVYRVYERLCRRLDVERVLRPVLPGNHPFEKKPDNLEPWETRGCVMPPDAVELVVD
 GDVSAEEVARIARETVEDVLEDVLKRGRETWPWRCHNVSLYEPLDWWERTSGRSA
 30 ARVELPPGLIQVSAAVVDLEEDDEEAYREAVRRVASLVGTRAEVMDARGSGGQP
 CSVCGTYPTVGDREFWEELSERLPPQLLKRWEGGFERLCAACLLKRYFGTHVIRS
 WYLEKISWIPSTAIEVAITPVKVGILNRWEELKDDGGFREAALGFLREVLPQLRQIAH
 YLRCVKEVDRAGELEEAADLKRDRLEPEGLPEDVRKELHRLTPKAPRLDEELGDV
 EDLSIEVLLCVEGRFWYDPEAPGGRLLEAGDLENLYTPYYALLKLDGDRMGELF
 35 SRDPETTRGASRATIEFGLKAMRIVHGHYGVLLYCGGDDVFAALPLHTALDCAFELE
 ETFRESLKKWKGTCAGLAVVHHLPLRDAIDLAYRLEKRAKEAGRNRLAVGLYRR
 NAPERVAVLKWEADGKRPWGLLFELADLVSRRAAYHLPRDWWEGWWEELDEPK
 NLLRSLGYYALRHRGEGADEGEIVGLVERIAEVVGKAGPEDGDPGAIEVGRALEIAL
 ELRSECPAGGNGG

40 <SEQ ID No.:1298;PRT;Methanopyrus kandleri>
 LTARHVAVGFLVLPQDRAFFRRPEPFRAAAESVAESEGPKPWTVAGCVRNALLEV
 DGDLEGEVLEYPRKLVRSAAPPGSIGEALGETALFLGTWVVEVRPGAPDRLERVWWP
 CPAHLARYEPESGGEAVDLLRVEEVGDAAIAFSGHDEALRRRYGFMTPKPPRPGS
 45 DVETPGRYVDTGTISKILAGRTPARRTPDLEDNVAGPGELLRPELVGVKLVGLKTA
 DEGYLYAARFLRPGSPVDGGSVLGFLTAVLPEDAWDDGVLEDLPSGGRLGRG
 RHAWVIPLRAGDWSDDVFPEVEEPEGDLPGLYLETPTPFEGDVRSSSPGDRKKA
 EAVLVRPGSPRDRVLQVELEVSEVESEVLADRVITRRVSTWSGKRASPDHLAAAE
 GTVLALGKLDVDPGTPLLLFPRMGDEDELLASRLAFHLSGVGTAYALSLPGVSP

50 <SEQ ID No.:1299;PRT;Methanopyrus kandleri>

- 5 VTDALPYFLVCRTPTTRAGAGQQRATDVIDLPLQREAH TKLPVIYGSTLKGALRHATLR
KLSEELDGETSEGLVDAVFGDRPGEGSPSPGVVAFSDAVLLAMPVRCEPGFLAWV
TSPYQLGRLYEVLELTGELEDLREAVEEV LNDCKDPRGNGALAPEEGTLLLDRI RVR
AEASDAVGDLAGVLSETVFEGAPEPHFRRYVEERLVVLGDGAFADLVNSCTERVVR
VRLNEEKTVEQGPWYEERVPEGTVFFGT LNVRHDTVPPKNGVDARKVLFGRWEP
DGVDPGDGDRKLEALKEAAGELEAGVLGAVADGSGDGYLDLRFQVGGSETVGFGLV
RLRQFVGE
- 10 <SEQ ID No.:1300;PRT;Methanopyrus kandleri>
MPAPVRSVSFGRPSGIEGTQTGGEEGTGEKP EEKEGTEEEKPGEEKPANGVGGGT
ETDRTRETSTKPEGPGKPTGGTEGTGGATESSKNGTEGEPKPSEPEKPDGGTGK
GRKNGGESEGAEGVKREPQPREPKGRRLPVWWVLPVPTPAALRRWISA
- 15 <SEQ ID No.:1301;PRT;Methanopyrus kandleri>
LRPATVVAVVLLAALAPTSALDWTGSQEYGAIGQE CRQAVERATIWWFAEGNEHLN
AAFDATYPVLF AERMDSLASRVPLHVPASSPADTWP AVRIGLLLYPTFRDVNRLL E
PILHETVYQGLAPVTD RDVIREKILGLVEAQDD DGSWGRWREEKPEETASAVELLR
VLQFRDVVGGQLGLDDTAFSEVREAVERGMAWLLGHQGS DGGFDQDPADHARVI
STLIDVYRLADRLGLD VDRDGILNAVRKGLEWLFSAESGVTWEDVDGSHGPVWTR
20 NGSPDVRTTGDVLR FALLKALWYDIATDVEVDTPGGK RKLRLIEDPEYDLHATVR
WLLKGQVATTGPEYGSWSDDEGTTAAAMGALEAYLNPRVYYDGYWRPADVRAEM
ELFDVTERGTTLVLR YRVTEGESL KATFYEDYGYHGCYEVWSGELRS GEGVLTID
VDGHTLYVFRIVARYRDGTVD DVFAVAGLKIPLFAGIESSDTSPVRVKGSTSRALLVS
GGLVGEDRDPGGSRRVPRERTGGGPGGAGGEVRGLLGDLPGGPRGLPGGSAR
25 EDRVAR
- <SEQ ID No.:1302;PRT;Methanopyrus kandleri>
LECAWKVYDRLRNESENKR RMGHYLGIRRYSR SRVHFQVKRLKNGEFVPVVTAF
AGRRKERGNLKGVRKAMGKSWTLYP
- 30 <SEQ ID No.:1303;PRT;Methanopyrus kandleri>
VRVRWVLLPALLALVLPVHGD AWWGPEALLDVGVQSDLI EDVHLKESDHGVEVV
DHVDAEYRAYIRVKEPGKPVTLHVLLPQGTEVLEARFYPELYPIEGIDLDSPDVNVK
WERIEPVSRSSEVTWKVLGWTWRWTQLDFRVTPKYDERRHGC SALVLKLRIP TAHR
35 EPEEIDRLPIAGPKHYPELG SYYYFGCIEWPAPLQPSGRGGGFNCWATSDAWSPH
VLFLWPGGFADIQEGFTNVSLTDHLVLT LGSGGGSGA AVDVGVVREEGERVVQS
EWPRVTGRFGFPYVPVAVIGLEKKEPSSPKTGRKPERE KPAKHELPPVPPVPPPM
RGRRRLTGKASNSSP
- 40 <SEQ ID No.:1304;PRT;Methanopyrus kandleri>
MKVTTTRTTRGMEPPVPPRFVSTRGTARPPYTYRKAYTAGRIRGSAGVEGAPDIGE
RSTLLALRWLELFSDVWIVILGLTTAIVFFVFGLLPS LLLL FVLLLISAPMTAPVRFVLS
TIPLIVLWSARLADREVIVLSVILLIAALWSARSAGRKVVREASRIVEEAEDIVGVVFR
AEGTPDKLDRRLSGLLKVPDRDLSGGKGTQFVVGSRGYIKGCRGALREALKIVGSG
45 DALREFAEEGSLVTFHVTLVIPPTSRYEFKTEHDLRGIAIPLGRRSEDRAPIVALLGV
GRRGSAEDWTLAFGGVPLGETFSELHPHEGRTDDGHGSRHRDHDGDHNGWC
AGGDGLGDYHWWDSDESGGIFESIVDSIAEIAESMEGGWGNGGWFGDGGDWGD
GGNGGDGGNGGC
- 50 <SEQ ID No.:1305;PRT;Methanopyrus kandleri>
MGFLSDAIDK VIRGVRRGRADLKSVRSALLFTPWVSVITLLALLESMSFNDLPRLSF
GLIVGLLSSSPFQVLGSRMVADARYLGVLSPVIGVLALLAVVYPPVPYLLSRLLSESF

WO 03/076575

- GLKLSHDVVLAAELTGIVYTLTCMVAASWKEYRWKAVLQIVASWTAFSVAFVLA
 TSDVLRSFVLSSSLAITLTASLVANARKHLENPPEITKEYLVGCLVVAALDVFVI
 ALSSIAYYAMMFFDKIVIWCGRGFPYPPLDVPASVGMVPLLAGTFAAGIFWIDVGDD
 LDRIYRVESRELEEIGRRMFLQFIKGAGIALALSGVLALVTASFVRPRFHYWMSGDV
 5 AYLLGPVLKASSALIHAVSAVPVPPFGNLTATLVKWIERQLAGANPDLLVLYLLGSVPG
 ALVVYTYPQLITFRREIEATVALSLVPIAELLAWHRWGVKWLALGYLMGTCSATVC
 ALTAVRMWLNHTEAYRVLSYNNFVSIVIEVQRHGGEVVRPRDPTIRG
- <SEQ ID No.:1306;PRT;Methanopyrus kandleri>
 10 MLGGPEVTIVTEGTYPALGGVTTWVQRLIEHSPNVRFNVLCAPPKGKTEPVVDIPE
 NVRDVVRELVPRRMGKRRWAARVFPVHRIRWLLGRRGEWAPRGFRVLERAPEYI
 LECEPLEEEMLKRLYEVSSENPKVLEGPTVYTLARYVEDQLGSDFSDLYWAVSN
 VCSFVMGAASGVRHMPCECDVAHPQNCGVCGFLCAIRKAVKGTPTYIITEHGVLR
 DTRLEGLGDVARELYRRCFESMIETSYRYCDEILASDYHREHAVKQGAPEDRIDVIY
 15 SGIEWRFPFPPSDVERKFREADRLHVGTVARVEPIKGIDVFVRMAARVAKEMGHDR
 VRFHVVGPIDDREHYERCREIVERRGLERVVKFHGSQSPEEILRFYHKFHVFLSSR
 SEGLPMALLEAMSTGCPVASEVGAVPYIVKEGIGRTFPAEDHEAGARALLELLQDP
 EALLRMSYATATREARRFDVTRMCEEYTRRYAKYAVPDPG
- <SEQ ID No.:1307;PRT;Methanopyrus kandleri>
 20 VTRWRYWAERIAEVARDLLGGRTRVYASVEGDRLRVIVSGNAPEKPLERAIEVAEI
 ERELGLEESWAHPHMHVVDPEEYEALWRGVLREAVEVRT
- <SEQ ID No.:1308;PRT;Methanopyrus kandleri>
 25 MPDCGTSSRVGKSYTVGRVVENLLTAGEASYICFYVAPEPLDDVERVLRLDKLSGS
 SDVLRLLKDLGDYECEIPVSEFLKNFGEDPKLSSLPKCTPEFYEEVYRRADGDP
 GRWGYFERLREYVEGPCTWERCDCDVRDHNFMVGARKVKRGVLLTYRKL
 DLPRFVESRERAMREEGEEPHMSVDRLREVLSGSLVVLDDAHHGLVRSLLAEVKE
 GIVRDSLRESLGGRLVHLSTVWAALDRNPSEDTRGKL RDVVF GDYAEKVRE
 30 RLEEWIESVKGKGRVRVVRALLELDHAVRTGEEVGIGGWIALATGGGVFAPEVDS
 VEKALELMLGEYYGLPGAYVVIANRPVLERPSVRVSVEASGEWRAYLLPLYRKEK
 DVGLILEILTRDLRRHRIAFLDRAETLVDRHIEGLRRLRRDGRGLGVEFRRL
 DVATARRGALGVGTGVGLVGCEAMGISGFLIARQYLSSYAPDLSVALLARRCEV
 RGRAERLMDRYGFSEEDATVAALRLTAFEDVLYEMITVAGRTAQAVPEAFVAVLGA
 35 GSIVKTASEHPVEEVYRGVKDAFGGWAPRMVYDPRTDREYDLIEDGSELPEPT
 YLRELDEAALDNLVMWLDGKLSEVP
- <SEQ ID No.:1309;PRT;Methanopyrus kandleri>
 40 LVESHAVPIPSDPVERIRALRVLREVYRRGKKPGFEVYRTVSGSTCGPYYVARW
 RRDSKFRHGRITLYLGKPENESVRFTWLVSLDRSEVLELARHLMRNLSVLKTLT
 EVSSLPYKRARCVLTRGLALAFDARPSNSPRI RDLEELPDRLESFLVRTLGGWPAH
 YSSHLNKIIRSRRKSLDGRHEVPDVQLELERWRLRHDR
- <SEQ ID No.:1310;PRT;Methanopyrus kandleri>
 45 LGVLGGPSPRLRLYVYDFKEPGGEAERRKLRELLESHGAFRLQYSTYALLAEPEVH
 ARVLRVVARVDFEEGDSLIVPMCRRCLRVARWVDAEGVRGLRF
- <SEQ ID No.:1311;PRT;Methanopyrus kandleri>
 50 MPWRSNVAVRMDFEVLRREDYHDRGAARGAVKDHLREREFQVDTVVYSAGD
 RGERVSWDDLSPARAYAVRAALRLGLEGLGFELDTGYSLLCDRDFFEVCGGRF
 DGERIPGVYALGNWREVRDRVLRITLGREYGPVEVRLGLEVRARALGDGTVLLSVD
 PRARAI SRVRLKDLVRDRGVGWAERVLPGTYVIPTDGGLTGRRLKVVDPADEW

- EGEDGWDLERLREHWSGYGVEVDPEVWTVKVGGGVLHYPDDVLRWQVPVHPV
TEYFRLGVADRVSVGRYLLDRGLGEFRRRFPDVAVEVREHPGSTDTRRVPPAVV
AGGEKRGKRTENDLLWNYGPYEGAGELDGEAVHLVADRELPGRAGISERDLERL
LELVVGRLLRLLGHDVEAGDVRVADAVDLPDLVGDADGPVLVGVLSDDDRTYARV
5 KRRDPLVQCFTERVLSDGKTVKYAATVLAVGIHCKHAGQPYAVRATSGPKDVAVVG
VDVSRKVEGGRVVEGRACCSCFVDEDEGLIEHGRTFTVPVGERGETSGRTAEIVLE
TAREYSDRVVYLRDGTVPGEELAVREVGLDGLDVTVEVIKSDPTVYAIEGEGW
RAPRGAYVRDVGSTVHLCCSPYTPRRRGDKKPGTTPRIALRRRDDKLDGLGLVH
DLTASNWGNPSGTWSRLPAPVLYADRASRLARYGVSVGPDPVSERPWPV
- 10 <SEQ ID No.:1312;PRT;Methanopyrus kandleri>
MGAPNDTVIFLRRGKIERREDAFRIGKSKYSAVRTTGIIIAGGAQITTQAVRLALRNEV
PIVYLGGNRILGVTVPFSERYATLRLKQYEIASQPSARLAFARPLIASSILARAIVLEFL
ANETGITGLEDAADEVRSEAERALNAGSTDALRGYEGRAACRYFRALAEVLPDWA
15 SGRRTRRPPRDPFNAAISFGYAGVLLPVLLSRTVAAGLEPFLGFLHGPRGRRPGLIL
DLMEEWRALAVDVPVLRRLDGLSLSREMFRWKGDVALLRDLDAVSAPVLTVLSRV
RGGLEAVDRRIREVRDGVSRQSPPEPLEFDPEDVGVVWDALEV
- 20 <SEQ ID No.:1313;PRT;Methanopyrus kandleri>
MRRAFPSTVLPVALILLPLPGHGAVWVDPEVLPDVSVKSWLIVEDVHWKEETTWHG
DKVLDYVDAEYIAAISTRNPGKPVTLHVLLPPDAEVLEARFYPEIEWGEAEVPPAE
WMIYIWKWERVEPADGSEVTWEFLDETWKWTQLDFRVTPEAHDSALVLELRIPA
VHRVPDLQMVPEVWNGEGISFPYGVKLKYLYDIGAVEWPVPVQPYPAAWCLDCAL
RTLSVKVELFVWPDGVFTHVPEGAPWTSYEVHVMHMLALGDVVTIDVVGIDPRK
25 MSYEEYERKRAEVRSEWPRVVERFGFPYVPMVVEIRQKRIVFDISLTPDPVEA
GSEVTVLVRPLYWWGPWCADWPWDCWPEEGVLRFLKDERGSVTDLGAVEL
LPGGYVDGGLVMFRFRAPEEPGDYTLIVRYEGPYGEYRERLSFTVKERGRRDGQG
RTPPSNPPEPPEQPPEKPPEKGGKRGFPVLVPPVIPPRCRARV
- 30 <SEQ ID No.:1314;PRT;Methanopyrus kandleri>
VERVALAGLLHDVGKLPQRSGERGSHQKLGAELLKKAFFGGREDETLGLAVLAA
RYHHSDSLGDARPSDLEVPEDWGLELAVVALADTLASAERGNNELDREEPRGDHR
GYWTLNPNWYRIWEAFRRRLGGEVPGGWGWTEGRPEFVPDELPLHLNVDPRF
EPPKVVEEGEGYRGYRGLAGRLTEWLKGLGVRDHPHPFDPARVAMEVTTSLVPA
35 QHYIPEGRDHMRISITLYDHSLLTASLASCLWYLVEEGHLDGPEDNPSEAYHRLRDG
LREGGRSFLVRGSLSGIGEFIRSVRRASPLEERRRTASYLKIIRGRSAFVDLLTAGA
AWTVLRETGRDAHPAFLRAAGGSFTLLLNTTEEVREALEAVREGLKRSVSEGS
GVLSLGLAWVELDWDALMRRERFRERVEELGRRESEDRRAVLPGRTTSRVEE
PCPVCGSPVPEDEGCEHCERLGLDGLSLVRRDEEDRPVFAGFLVYEDRDGSGDG
40 GDVVHERDGHRYRVHVTREGLGGAVSVGGLLLVDPAHVEEALKCARKAAKEGKS
PARVVMYSYFPWYAATKDDVPESEEGEIGATFSGMAERSPGASLLGFAYVDVDNLG
EWWREAAGDAFGVLLSISRFTDLVFRHWVNALGFRTVAELLDDVPGLEVRLADGGR
ELDPPELLPRFGEDGEPEPEHGEDRGRPFLLVYSGGDDLLVAGAWNEAYSLPFEV
FLLFSHVTGYLPVASLSGAVVLRKKAPFHLVLRALKAREREAKRAGEGDDPVRVR
45 LAPKGYVSLRLRLSVSKSLNVKELESSENQDTHPVPGPVRFDLALAAVDMLKDVVG
ALDRKARAYRLRLRSLWWGRGDVGAASALAYVVSRLMEDDSGVDLSGTLLSVLPV
KPPEDAELYPVGLFDVALIPHILARRGG
- 50 <SEQ ID No.:1315;PRT;Methanopyrus kandleri>
MGADLRPAELAEYLYKPGRLDRNRREDAERRFERLLNDFKAKRIQLKPSDDGLLE
LAFFTALVSLNVSNSQLRRLYAEITNVRNETRRAREGKGSWEDVVAALGKARVVLA

YTKGRQGKEFEGLYEVLDEALRKATKIVEDSEDDVRRRAIEALHFLAEGIVAFHRF
LGGRS

<SEQ ID No.:1316;PRT;Methanopyrus kandleri>
5 VVGIGGTITLVGEIRLRTGTRIGTSEEEIEIGGLDNPVIRDPVSGYPYVPGSSLKGRAR
ALFELAWMKSREIEPDVFFGAHHNERHECGFVRREVYEEAKEYLREDPPWLENGT
CPVCRIFGSAGDGIGFSDPGRLEDERRGLGYDPYGRYRDPNDAQELSGVVDVKKE
ARVAFRDAHPTTYTVNDVFERAGEPTEVKHENAINRVSGEANPRSMERVPKGSRF
10 GLEVYRVEDGEELESCLKYLMSSKLVEDQGIGHSTSRGYGRVEFRIAALCARST
GWYLDPGAGEGFPEEEDKDEAADEVTYLSDLEAERYEIVIRARDLEDRAYL RPEEW
VERLDEVVGELPWGR

<SEQ ID No.:1317;PRT;Methanopyrus kandleri>
15 VELVLELSLGRFRAGDAIERTRTSVPAQTLFGAILGATLELLRGDGEDPDVVKEVLD
ALVGGLELTDAPFLDRGGEP LLPVEHVRRELS DPERYGEVLREL AGDDVDTGTHG
LVTEPERLPLSLFTDLCVEGSPTDPATLKRLREWLSGEHDPVVGSGRLTHASVPRT
GDDTTPFTLDYASGRGIEGPTHVAFLRYDGKEPDYYDVEALLRAVLRYLRDAGLGG
ARSRGAGEVLEAGLREPEGEEKLLFSQRMVVEEGEPAILTSACAPEGDAEFYGRVE
20 RRLGHYARVGPFTNYRVPRHYLAATGSYFPEWPGAENLRFEVPEGLPGFLRGD
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<SEQ ID No.:1318;PRT;Methanopyrus kandleri>
25 LTVLLVRNVGVNDVRVDGERVNEPYVVKELVESGDLDGVSFPILERVLEELEPDRI
VLFATDQDPGSTPRHLKAKDTLYVAEAMRELLDVEVEVRVIRENPSDHDAMLELYG
RELPEVLDGAEVYLDVTTGTPAQLALALKGLEVEPD AELVYVSESTGTTRIRVGD
ELLRRIADELLEYGLNDPAARVLSHTGLDDLRTYAEARAAEDRFEFERARELYRGLP
EDFLDVSDRLERVERALSDDPVERMAERTRYVLDRALTHLKRGEYGEYVLR TCVA
QEMILWTTFSAVSGREPDPDEFVRHASREADWDPKYGNLGD LIRDPVSTLARYL
30 GDYLEDLTSLEVTDAGRAAAVNALASYVVKGLREL RDDYAHRAIRITLEDVREALG
RSRDSEYWERKHGHGPDFKFPSEDDPEAAVEALRECVDAIERAVGR

<SEQ ID No.:1319;PRT;Methanopyrus kandleri>
35 MSGLETVEVRLEVL TPLHVGVPREEELVRGLDYRVDGNRILVVDFTTLPPERAERV L
GALEGGDHAEAEGLYEGAEVLREVELRTGGVPDRFLPTYPTRVDDPWIPGTSVK
GALRTGLLLAALKRLDGLGTDLSTLDRLPNPKKAAVALDNRLRATVFQGGTARR
SYRRKPNRGWPEVFPHADVL RALKVEDARPVGKIRTAVYRAELHPKGRPLDAREF
VMSGTFEELGTDHGELKRVLDTWDRVELPRLPKPVFRFLRDVRSGLRDFWEETLE
NPETVLERAREGWREGLRALSERFRVDVPDDADVQLGWGGGRLVK TALPLAGRV
40 LRGPLDQFAPQTVKLVLDGEVPGLVRVVEGG

<SEQ ID No.:1320;PRT;Methanopyrus kandleri>
MSRPRPGSRGWMLMSEGVFALIVILLTFTATVGSIHFKHTHPRKQNR LTRLSHARCI
VVVTEDLCGGSRYSVRLAEMLRRGVPM TFAVPAWEAYAYPDRMRKLRELGGDLI
45 NHANDGGASYAFLGRPGKVAGLPVKTQRQIIHTTQKWIHRATGVRPD AFRAPGLAI
DENTYRALVEEGIWVDSSKIYTRPGTRGGAQVDRDRRPPDPRGTHSVLRGVAVRA
RAAGGAGVPVLVRRRPVRASQSDRSPPRRRWRT

<SEQ ID No.:1321;PRT;Methanopyrus kandleri>
50 VFVVL FHEHITANPKYWWIILEFVDYARSHPGVAFATIDEFAELARHGQRFTAF

<SEQ ID No.:1322;PRT;Methanopyrus kandleri>

LKGVTVRFEGLTALRDVDLSVEEECGSSSRASTWPRVAYSRVAFGMRYFPSAEGW
GFVLLGTVASASVGALVALLCREEKSASAVLNAVASPMFLGAVVVPENLVPRVAF
EIFHRYPPVTFIHALRATDLYGKPVAVADVVGTVLTATVFAASALVFRRARELRRCR
NSGL

5

<SEQ ID No.:1323;PRT;Methanopyrus kandleri>
VRVVLVYDDRRGRRGFRPSWGFSCLEGRRLFDAGGRDRILLHNLQEAGVEP
RDVELVIVSHDHDHVGGLPGLLDGNPGITVFASPSSELDVRRVNRVRNREEVVS
VLAVERPNNVGLLLESEEVLLAAREPGELVELVRWVCERWEVETVIAGFCRYPGAA
RIRQVAEVLGELGVGRVVGCHYFRPSDARHFERWGIECERPGVGEELEL

10

<SEQ ID No.:1324;PRT;Methanopyrus kandleri>
VFLTGVPLALWGLRLIAAGTGLPLPLVGALAWLFQWVFDENEEDVPPSYWVLPR
VVLSKPPTWYLERALESPDTLLDYLLTGAVVVSPLPLTQLVWVLLGGPTGVLEILDY
LVQLIGEIMEDPGRTLPEVILWFLLPVLPHVHVPTWLAALGGLPALLAHAGGLLLAP
HFLTHAPAVTFGATVTVSRGGSCPTGVRNVASGSPSP

15

<SEQ ID No.:1325;PRT;Methanopyrus kandleri>
VIEKVLADLNRVAGVNGSMVASSDGLVVAEAVPPEVDPEIVGAIATTYVSGSERVIE
EMELGELKQMLVESTDGKVVIIRVDDDALLVLIADPDANLGLIRLKAREAAEEISKQL

20

<SEQ ID No.:1326;PRT;Methanopyrus kandleri>
LVEPIRSLPGSRTRVKLTRECIVIRERGETRRIRLEDVVGVEKHPRRASKALDPAEDT
RLVLITGDLERLVLVLRDGRLYWGLKALLAARDGETDRLIRYLTLLRIAGHPPLER
RDGRVLLRWPWLELELGSPERAETVYRELLSRWEELLESDEKGHDLDREARPVWV
ALSVPLAPMVMVTVGVHRRLIAQVSPVLIWGAKLAVDVLERVVGKGPICQCSVAWESV

25

<SEQ ID No.:1327;PRT;Methanopyrus kandleri>
VLCGVGVGLISVVPWLALFAFPYWYLARHALPYVDGPLRFELTRRLGTMGAVTGLW
CLLAPLVVGMYPAPAVAIPAAAVSIVPAVRVMACLRAPSEFTIALMNVGTWARRTSA
AGACVALVATALAGPVVGGLAELASAVACAYVVSRRVGIASHLAKRVWIPTDRCSG
QRPAKG

30

<SEQ ID No.:1328;PRT;Methanopyrus kandleri>
VGVVESTEVPIFRDQEGKARALILRYDPDGGVFVRYGEREDGSWEWTGFRLTAAE
VALLKEFFNRIDPLHVQRLESGRDRG

35

<SEQ ID No.:1329;PRT;Methanopyrus kandleri>
VAVDRDLCPDADLRKVVEALGFFFDPVRAVGLALNLRGHMCFVDGPGAGKTTFLD
AFSVAVVSGEGVTREAMVWDERTDRPGVVLHYPAGFVGWDECDSIGSPVRKLV
EVLDLFRLEVVAHAGELRTVRHNRRFLFAGRAVPAFPEVDLIRFLGRMQYIGGVGGDIR
DRVLSGAVDPRAVEALYERISWDVQAVHLAGCAAEGPFVSGEFAEEIFRGYLRRLR
EAFAAALLEAAKRFPIGAGAGLARKIAMAYVQDKINRFADTVIAFGGPEAVADVRE
YYALCDLEAPEDDVECLVHAWVNALMNNYSQWCAEGKIPGPKIAYETIASEDDL
RFEDVVG

45

<SEQ ID No.:1330;PRT;Methanopyrus kandleri>
VLALLALLAAQPAATPTVDVFFEGPPDEDHADILYLVVSKPGTVRVYLPLNSEVR
GVYWFAADELRTVDGLALPPRSEWGRHEVRDWRLTSEGLEWRDRLYAPVGDDW
PVRVPIDGIPETVRNAFAGLLERGYADIPVLEARVDPGLLVVEVRARLVSNHLLMYLV
PGYEFNAATYESDNRHSYYLEPTDYGFIQGVNVPTFEPALVAFGLEDLREYEW
PVKVNWGWVEREGPPYRYHLFPALVPLVRRRLAVLLAAIALLPAAAHANPRILPP

50

WO 03/076575

- 5 SP PPPV FVSQITVLDGGMKGNLHEVHV FVRLWPGTEGTVYVPREARIETA AVVPAD
 AVLSSATAGDVRAWCERNHSPAPETAETTFELPEEVSVITWWDEEFRTTRDLFLES
 RLGRAMKPLLDGVLALRV RADDSDFLYDLLVPAGWRYLPLGVTSSLLHPFGDPI
 ALVRAGDRWYASYANSELLRSLHPDLFLLLNVEGSWGTRLNTEQLWEKELRRLSE
 10 GPETVIVRSVRGDEVLDVVATVPEIPLPAGSKILKYGTVP RDAYRDAYTGV LAPGF
 QPVQYRVVREGEMNVPDGTVEYRVVRVDVSPDRLLVIRAI VPMKNGKLVIPVVG
 GTVLGSSYYDRKEAGGFEWLVEEFEDLKGFRKFEP RRGWDRRPKPLEVLVGLLL
 TPLLLYWVSTAFGGDTGSPLTVVANFLGELVVD SLPSP LREALKPVTRLVG YCVIFLL
 GALTVAQGS LPL
- 10 <SEQ ID No.:1331;PRT;Methanopyrus kandleri>
 VRRVLSPAIVPIVVLVLPVHGDSWTDPEALLDVGVQSHLVIEDVHEKEVTTEHGD
 TVKVL DYVDATYMAVIKAKEPGKPTVHVLLPQGTEVLEARFYPKVSDRSPSEVLSD
 PSRFESVKVKPKGQTEVTWEFLDET WKWTQLDFEVTPEHDPGKPFYSLLVLKRI
 15 PALHRVPNL RMYYPKH YDDALRSEYSYGVIEWPIPAQPGYDNSFYVRSGSETLDVG
 VELFAWPEGVVT KSSAAPGWDTCQARLTDHMLVFPEARVAVLADVSPAEDYEKW
 KHQREEVIEKEWPQVTQRFGFPYVPVAVIGVERVEVSFDLLVPERVDAGSTVTF
 VRPYPEPWSYAPEEGVLR FELRDEHGSVMELGEVKLPEGSGFEGWVEFRRAPE
 KPGYYTLFVEYEGPYGNGKTSATFRVEGRGKRCKLPIPVVPVIPP RRRARA
- 20 <SEQ ID No.:1332;PRT;Methanopyrus kandleri>
 VGGRVEWWPEPPSGRRARESGPAIGRSVLLLAIPLLMVSPVSGVTYVVPDVVD
 GAFSLEKEGLEHATPVVTSGPVERFNTFENMVVDY EYVSVDNHDLVVC SNPFDEI
 25 DVRITPEGIRVEYQTSRGTVRRSLSFNPEHTYLV LGLQGLRTIPVEPQQGGGELPVLI
 IHDHRVYEPTTYFPSPILGRYARDVTPLAQAVELMGGYDLLVRLEVDGSTVAFDLVK
 SDG
- 30 <SEQ ID No.:1333;PRT;Methanopyrus kandleri>
 LNTGKAWRESLPPEEARKLLDLARED LAKIPQLKS GELEDESGLRLVYDVTEDKVL
 LLLARPSLEFIRGHNPRLAELLHVLESTADSLLEWDIFQLSARAREVKDLLEGAGLAS
 TGAIRYLLHPELALGTFLTSGFGFIAFLPWIELLKRFPRLGAEFRWEP SALLEYAR
 RLAYVGVLYGAELAYWTCCEIAVKALLRV LGLWDYTVNGRIFDLADSDVWAPLLEE
 PTKRLMSELSGLPRPLVGAWYGLMEAVTKREIGPGGVNVRNAVLRVVGHA VCATL
 35 PLPLGALLHSLWADECDFGDRFLEYWPGVLAPVLAVLGALAENALTGW
- 40 <SEQ ID No.:1334;PRT;Methanopyrus kandleri>
 MRARTHVLLTYLLTAPFLGVERAITASLSAILPDL DHPNSLVSSALYPLELLTGRDLRL
 ALSRRLRHRGILHCPWPWGALAYLLWATGHPNAALVPLGGFLHCLEDAFTTMGVP
 VMWRREGGSWRSVRLSLTGLPSDTWDAILPPLALAVTWALFLLNPAEFHATHLDEN
 45 PYLERAYWTSRAVLLRPFLHTVEGLNREALRVSGYGR LPHVRAVLRYDYGPREVS
 GLWTPAGWVRGDDGRWYPPPTHGYSLRSLSYERAAYRVGTVRCWDAPEGALVL
 RAVLAYEGLSPVALERLAREAVLLGFRVRHTDRVGGHLVLEGGGLAIPVLHRLPRPA
 WCRVTFLPSRSLR
- 50 <SEQ ID No.:1335;PRT;Methanopyrus kandleri>
 LTPWPLPREIEEIVRELPPGAYVASARVEGVPEYDLLSDALRDALGRSSTSPYRVLV
 DRYLEEVDAPLVFQASNHFQLNHHARRALERLAGSV PVLVLNRGYLPAVECEDLTD
 ELAGTDSA EAVEAVFDDGRTVTLVEDPSRLLRALAVAGIGLLILRTTVDESVD FWALTA
 LGLAGLAVSKLG
- <SEQ ID No.:1336;PRT;Methanopyrus kandleri>

- LIPTLLGLLLLTTPAQAADVPADPTLGAGKVVVRFTPSSSGEWLAQAYYSPPRGKLAI
VSVSGSIAGSRVELRDYAGGPLRVSVVDVSEYAPELSQVLTPVRVERRVTREGST
YHVTIVISNEAHPVMVRLTYSNWITHLDFGDRTLDDQDVSVVLEGEKLELEPFVSRD
SRFVRADLWVTDAGGFRYPYTRLGPGDSLTLHLDVTADRSPGKVTVTRRLLS DPP
5 VPVSLTVSVLRPANYGLDGKKVSFWVPAPGVDYLVRYLAREGDRLVPKSLEGE
YQGVSVVELQGEPELVSVYKQPARMVFEVRDRVKLSLRSGSNGSSRLWVRWAS
ESIPGGLATDVRLKGRAGRVLLGLVLDSTGEANVDVSGGTVLERGTLPGRAYAILD
AGPVNGEKVVRVTSNARVLDVLSKVVDNPGVA
- 10 <SEQ ID No.:1337;PRT;Methanopyrus kandleri>
LLRLIKRILWGILSYLHEIILELLLAIVDRTIVLLLPIRLPYRLLLETVRRALRRGLTGT
- <SEQ ID No.:1338;PRT;Methanopyrus kandleri>
MFLVRVLLTDPVGPHEAYGTVPPEAWSLLEVVLQSLEGRIDRLLGLELTPASVALE
15 SIAGDVGVLTTSTDPEPVRSVRRVFGSCDVEGVYREDVGEAREELEDMPEDTI
VSRELDVLGRDWCVLGAGTALLSGGKVPALIEEEIRPGEIRAWNSFSREWFA
- <SEQ ID No.:1339;PRT;Methanopyrus kandleri>
VVARWAVTIPLILLTVGPVAGQPILQGSSSDDWVFGWKYVRSEVFQRWVDAYSPD
20 GPPVLVDAENMSAPDVLVLPDRDVFVCGTSEVSVGPGRVEVSTAADGFRESTSL
DVRGPAVDAWPDVLAALLDDTVCELRLREGQMPPYEAVIRKGEREVARETLDME
DMLREVVEYAVYPDRVVFRVLGRPVPKSLNPSSPPNRRVIVYTITFLPREGRILVSRTV
SRDPRLLYRLAQFASTYSPTVQVGVLKTPSGALPLFARFQPPWEDPIIEAVDRAVLA
WRNADEAELREVLREHPNVRLPEPWWRRSGGNSVWTPLPFPAPVRPGRRLRLRL
25 AALVLLALPLAVAPASATTVTGGALGDYQLLHECRERALQELTGGAHVTYVYNPSG
RSYTCTYRPEDGSFVVGPSRLSPWDIAIQKLPDPAVISVGKYLSSYLVIYHAGRTY
LVAPVTDLGPVVYVLEGDSVRAYLAPEWVSTLVGRTRWADATFELSGRGCTLRYYL
IRDEDVVELTVRIDFSAERPEFWGRVSDPRAIKEIERAERVERLSGRVGGVVMHS
LEGTRPVLVTFELPEDHPLRRFIDEIDIDATDPVNTSMSRLSWWFEWKRRFPNVEL
30 LPDPSDPTAGTLCVLRPWLAIVPDLLTAVCALPLDLALTTLERRLYDALEPRVEP
WIRDPLGRFLAAVAYYVPVGLLEELLGRLLMPPVRSVAVIPVLPVGLRVPEWDVDE
DVKELSERALYCAVAPVVDTVAMHRVAELVGSPVIAAFTYALLDTLWKDRGRWLDV
GYWLAFPVTILLPAIGGSVFSLLWSSLPQPLAALLYGLRNTRILTSPPAVPGSVHRL
VQVLTAVALTWTPLGAPT
- 35 <SEQ ID No.:1340;PRT;Methanopyrus kandleri>
VRLPREEVLTRVLDANAVDLYDVEMLFDASYPGGKVRAYSVLELHPPREGALLHPQ
LRPRRHVLGPGEVRPREALIWGAGNEPVVRLRPVVRVIERDGRRSIECAVTGSA
WVGEREARVALRAEVDPAHPAAGDPRGSRRLGPDILPHDPSRDPGPSASASWC
40 APTTVASWGRTSDPRGPRGGPPVRIEVRPRRDGRRRGSGAADLLVHRWYVTPASP
DWTLEPATDLTWIATLDDRFGRWTPILELRLTADPILPVHPRLVPDGLIDVPLGVSSA
S
- <SEQ ID No.:1341;PRT;Methanopyrus kandleri>
45 MTVSLTRALGMPDVLHRPVFVPRLPPEYALVGLAAYLTALATRHVYLGPLDYLAFA
LVPAEGFFVGCSPSGGSV
- <SEQ ID No.:1342;PRT;Methanopyrus kandleri>
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50 DIFGALDTLLRVLRTLLAVPSNASVLSALLPTLPYLLPVPPWLERDVGDFHLDPLLR
QTVVPGQPPQSRPQEAGARVVPAPHDRGPQGIPGRRVRSTGTYPCCRFLRPV

- 5 <SEQ ID No.:1343;PRT;Methanopyrus kandleri>
LVGSRIPSPDPVERIRALRVLREVYRRGKKPSLEVITYRTVNGSTCGPYVARWRC
DSRFKHGRTLYLGKPENESVSFVEWLVS LDRNEVLKLARHLMRNLSVLKTLTEIS
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HLNKIIRSRRKSLDGKHEIPDV LLELERWKLEY
- 10 <SEQ ID No.:1344;PRT;Methanopyrus kandleri>
LDVRSLYGLALDVTTLAVLELVKRYPASGEKLPEDRNSVELVLWEVKDLFRRFELGR
LVDEEEFLEACFEVLR LPGVPVRVGGACEEAGLET LRNVFTDPDASVLFITSRGLDV
FEDVMDGLGMDPKDVRAECRLLVRDDGAVGEDAIESWVEAGFEVRVITDGESHX
XXXYT DNVMAITGANMTNVS LERLRECFVAPVVM DVKAPVALLEYEPLGFAAMV
GANAHAVLREFLTPDRVYGGYLPECEGLRHLYREL RAGLEWYLREGCP EMLW
WVEPEPRT PDL
- 15 <SEQ ID No.:1345;PRT;Methanopyrus kandleri>
LSFHVTVDVTTECPHDCPHCNLRGTRRAGHLDPEVLERILAEVADRYDLDFVILTGG
EPCLHPRFGELVELCRRYDAGVGVNVATEVHPALADV DHVYVALEPHRGYGLEGA
LRTWEEVARLEPDEVYANTVACRD TYGELRRVNEVAVELGAAAHFVIAYVPPGPDD
PLDDYPHDEL PGLVRGLRRACLAGMPYQEEVPFSSCRHGEYNLHV RADGELTPCQ
20 HWKTYTLADLDEFEGMRGLEPEGPCRDCPRFE ECQGGCNAYAWN VAGRLMPDP
RCPRVRGSP
- 25 <SEQ ID No.:1346;PRT;Methanopyrus kandleri>
LLPYLV LGLVLALAPASGELLIRGSLSEDKAFLKEYLESEVLPKWKDDPRVIVDYS DW
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VVANS GFDSVTVLVGDYVCGVEEKL VVGPPYYIAVLKEGDRVIDREDLGGLSVSD
VEYEVYS DRVVMRVLGFGEGGKPLAIIVT FDLKDGRILVDREEITDAALIEKLSGELVE
YPEGA VLR TGS GVEPLYVKFGAPRDDPLVR FIDKVRMYGQGASEEELRRVMSEH
30 SNVEFLFPERGGGEESGLPVWVLP LLPVPLTVRRR
- 35 <SEQ ID No.:1347;PRT;Methanopyrus kandleri>
VAKMVNSAWVRLK SHERKLEKARTVERVGRFRLNLATLGAVVGLALAGLSVLQPTL
LGT LGTFLSILAQVVT LAVQLASLIPLT
- 40 <SEQ ID No.:1348;PRT;Methanopyrus kandleri>
MREITDSPLAFIPALLGPVAGLYVTINGLSVEIRCRHPAGW MYNDAAVILPVTA FRDL
LFPLVSVVIFKTAIERLRPLGPFGLFVAPVIAAAWEWAAERAFGAVLDRWYSRTTLA
PLVEEPFKRLVAIELGVPGVVSGLAYGLLEGLWKSRTLWGRKDVVSLRLRYIALNYVF
VHALLTVLPLPIAMEVHYHLNASWFPEPEKVHLLVIQIFRDLLTGDIRTMLSMSYYTIL
45 SLMLESTFGIPVMMKI
- 50 <SEQ ID No.:1349;PRT;Methanopyrus kandleri>
VADYLEALSCLKSHDLDRCLVADDLPIHYLT LIPSADLLTDNRPQTFLERNELRVQT
SFGEFHVGLRTPAVVSGCLENVLLRLGAPAPVTLLRDGTAAFVSPIGVIFARLDGRV
VPEAEIRY EKYWRSASNFFRAPSADYYEYRFDARRGVAEVRFYDLERRIAVTVSLN
FNGKSATFSES AIDETTLRELRSRLKRVSEVQDAVLV RTPDGTEVWWVEFGVPGPP
PGLTSRDGTEDPQHHA
- <SEQ ID No.:1350;PRT;Methanopyrus kandleri>
VTRNSEVDWLHSSNGPTWPLSNWVKAVKYIVYVAPERKEDPTPLKVQVAESPN
TLDCSTKDV PYWGEVTWGVKVSERDFANAVQAMNGGTLESQ LFKAAVRIAYWVASK
IPARDYSTPGDMDWTEFTPLQVLKEYWRGWNCAGHAVLAVALMRAAMIPAKVVG

LLAGEGHAWVAFYNQDFRWVHVDPTGDAGNSYMLYLAPRVITDDDVEAHSGYY
 CDDNATTIDDIEREWIPVAPIVVVAALMIY

<SEQ ID No.:1351;PRT;Methanopyrus kandleri>
 5 VGWCENVMTAYRVRAQGPRVRAVVVGHQPYSLSVAKAAERLKGEIDVEMFYM
 WDLRERPEEFEEAMRRADFAVLNVMSATAEAVDLDAIAEETPFVAVHSCFEVMR
 ASFKSLGLEKSRLFRFFGRMMERRKDNLSGVRMDEALERGAKFAERMGWFGALK
 KLKIAMRAFRYWDYGGADNVENMLLYLAGELAGADLREPDPPEEVPGRALYDPEE
 10 GLIDVDFLRELREEYGTLPVTFYKFFYTNGNTEHVDAVIEALRERGAVGAYCSI
 DAYGTLTRFFGDERPDAVVALTCFRIVGGPMGGEVERGIELLRWDVPYFVAPQV
 WYLDREEWEENEFGMDPLSLLINVSLELDSAIFLPPVACQSEVGRFEDVPLHAME
 PIRENVDRAAELVYRWLELRRRGPRRVAIVLFNYPPGEENVGEAAYLDTFSSLRNVL
 ELLRDGLDLEVDLDRVTDDVLRRLGNPDLRHRRPEDVPAADEVPLDRYREWFEEL
 15 PEGSRERVLEAWGEPEEDPLLVDGAFFIFGLDLGDVFGVGFQPTRGLHESEESYHED
 TTPTHYYVCFYEWLRREWGAADVHLFGTHGTLEFLPGKEKALSEACFPDLLITPIPH
 VYLYNVNPNSEAAIAKHRTYAYMVSHLHPPLADPELKGyreLLRLCEAVREGREDV
 EELREIAKAAGIRVEVEDDDAYVGAVESMVRALRDRIPCGLHVVGADPDPELVAET
 AVSYAESRDLLDADREEAVEVVREYVEEGEDRLSEVFADPDVAVRELVDGLIESYDR
 ETESLLRTLRGDYLEPSPGGEIERNPEVPTGRNLTALNPRRIPTPEAEERARKAVR
 20 ELLERYREEHGEYPETVGLVLWAFETMQTGGETVAMIFELLGVRPVRDDAGNVIDV
 EPVPAEELDRPRVDVVVTMCGIFRDTFPNVVELIDRAVRKVAELDEPEDVNPVRKH
 VRELREEGHGRPESRVFGPRPDLYAADNMRSKVESDWDDESELIDAYLNDMGYV
 YGEGVHGEEARGLFEAVAGRQDATAQVRSRHSYDIIDLHYEFLGGLTAAAEADAE
 TYVIDSCSGRDPEVHDLETVVRSGAVSRLLNEKWKRHMLKHGYDGCREIAKRVEYL
 25 VGLAATTSVEDWIWEGVAREYLFDEETRERMEELNPAAVREIASRLLAEHERGYW
 DADEETIERIREIRKFE

<SEQ ID No.:1352;PRT;Methanopyrus kandleri>
 30 MTASTLITESTFDALSGLEPPPEVGILVITAVIATVPTVVAIRIGGILGRVVAYFLTVALT
 FSALPLILHIQRGLELGPPELLTALMMSTCSLSILRLATEGLKLTLSAVAVVNLGG
 FALLVAVTGGWESLELALSSHWFRLMVVPAILTVLTYWVYVAVRDVLDWLRGR
 ADPRDLEAAEALLEGVRACERRLRVSE

<SEQ ID No.:1353;PRT;Methanopyrus kandleri>
 35 LHLASRISTDRRARAKAEGTLAFGSALQTLVSVGIAAALGTRLGDGEVEVTNRAVESL
 GIRPPFDEEKYLRLGTSVRDDPNRAYETMYRALWRWPRKVFRELHRTLEEDQAAF
 AGIVDYLWEEIIRQARESPALDEFVREVKGWKVTREAAEATGLAGSIAGTVGDLLR
 RSLSRHLHGSGEGDRDRSERRDEHRSWRLGDAISQYSGSSEGTSPLSKRTGDAPR
 40 GRGEVARDPGFDGVDGAGRSGEVPRTRPREPEGTARGGRGTGRGRRGPWRWL
 RR

<SEQ ID No.:1354;PRT;Methanopyrus kandleri>
 45 LLEILALTVLTPEDPGRFLEHVLENPKVLLAAGGGRGGAAGGRGGGFGGRGGGR
 GGGAGAKLSPRAGEILES RGKFLRELRRPRS NLKCCPSRHSEERRRLLRLYGKVR
 VYYSTVPPTLTIGGIVALLSTPFTVFLPLRRALNRVWERRYGPRFRGGDPLWYLRYL
 DEVRFRFNERIAGRLWAISALLTVVAEGELSYQAAYAFADAVVEGGEPLSAFYDW
 AVLGMEALLAVYVATSVVIALHLVTRDPKHRRYCPIFRACLPRPYRRRAWRTLRTL
 TVPVSILPVITGAWALRWGLWVLS

50 <SEQ ID No.:1355;PRT;Methanopyrus kandleri>
 LLEPLTLTLLALPGDPGDVLPVLEHPEVFPAMGRKGHDGERWTGRRKRVRQVDA
 KLSRVGEILSGRSPGTRKGSELKRYPERKRERLLSLYRRVRLYYRTVFDELVRLLV

ALLVTFFMVCLAVKAAGEDSVANLFRLAGISIIVDIVALIAFCEIVLTAVEDFADAVLAG
ESPEAALDAFYGGAVLTGYSLIAAVALWIVRRTSRELDVRTLVQASILILPLVAGF
RALVWGMWVTGRYADVVPQLLGFTSVLIVIYLLVRLNLKLSKDRASP

5 <SEQ ID No.:1356;PRT;Methanopyrus kandleri>
MEPLTLVLLVFPDGPGEHLGHALLEHPEILSAVGGGRGGVAGGRGGGGGRGGAGVK
LSRAGKVLKSPKKFYRVLKRLKRRKHRPERERRRLLLYWKVRIYDRIVPTALILSGF
ISFFVVPVLDFLSDRLLRKAWERKYGRRFRRTREWRHRCDYELSRLCDDVYRRLF
10 LTSLLGFLVVGVEGIFSTWAVEAFADAVLRGEGFRAALDAFRWYGVLMMEYLLAAY
AALCVAIAASAVARTWERRRTERLREEVRRRLGRRPEKSDPPSCIPESFRTSVSRV
TRALEALLILPLVTGTWALRWGLWVLS

<SEQ ID No.:1357;PRT;Methanopyrus kandleri>
VIAGGPGSGRVVRAGGPGRGPRAGRRAPRGPPGQGRGGGGGRGGGGGRGGAGA
15 KLSRAGKVLRS PGKFLRALKKFKVRKRYSKRERKRLLLLYWKVRLYYRTVAEGVLL
YASFALAIVIFALDFLTDDLELLRETWFERSLYLTSGGAFLAIFGEMVVANRAVSASF
EAVLRGGGLPAALGAFAWAVYGMGMMLAMVALVPLIHALTRKEPDVRTLPMLAV
PLATGIWALWWGLWVVS

20 <SEQ ID No.:1358;PRT;Methanopyrus kandleri>
VHHTASEMLAVGAALGVSGGLAPGPLQALIVAETLGNGLRAGLAVAVVPVITDGPLV
TAAGLAAARLPGWVRLYLGLAGSAVLAYMGLSLIREADSAEPARSEGAGSSLRRRAV
VWLLNPHPYVFWLTVGSSMMGSARSLEPMVAFVPGFFLGIVSTQAGIAVAVHRAL
SLTPAERVGGARRLSGVLLLGAAAYLAYVSLRDMPS

25 <SEQ ID No.:1359;PRT;Methanopyrus kandleri>
LRRREPTYQVSLDGLRESTSALVIPPTRSRVYALDRVLERPHSVLGERVGSYGQL
EGRSSQSLTRIMETQNEIRQDPPSE

30 <SEQ ID No.:1360;PRT;Methanopyrus kandleri>
MRLWESLVLAMLSVPEDPGEWLG PVLGHPVLLAKVGRGGGRVGIKFPRIGRTSK
SERLPRVKIKNWGYPEREREERERRERELLVYWKVWLYHRMVPYPYLMKAFVV
LLLGGLGLVALYCLGVLKRTWRYALLTSVLA AVLGLPEAVMTNYAVEDFSNAMLA
GGGLQDCLHAFKWWGVYGLWTLAAYVMLVLA AVLARNALRDVPVPVLALSLAIL
35 AVPLVTGIWALDWGLWVTMS

<SEQ ID No.:1361;PRT;Methanopyrus kandleri>
VRLPVVLTSPVLGILLLSIHVARPVNPSSHYALDDFLKVEFDGMRDGIVLKFPVALD
GEVYVGSSAPGRYPYPVYRYRDPLEGGIANVWIEGLPYIGRSGVHTFIFKVINTEGR
40 PIFYGEVQVRRDPRTGRFQVLRG SVICGPFVYCPRPDGCVIRYRTLEPVRTLVVR
RPDGGIVTRLEDGKPRTVHEFRVTGLRPDTEYELIVRWNGFELAKREFRTAVPDGA
AGFTFAFASDSRCRHLKESAGGGDADAYGCNVEALRSIMMFAARHGARFLVFPD
LIYGHATPEDARLQYWNWKQAVAPWEPSPVYVGYGNHEAAVVGSGGRCSGEEV
FSREFVTPAELGRGPAGVSEGRGLPPYGD TVYWFYGCVAVVVLNNCYSGMLRD
45 WTGPGECPYLGVM DRQLRWLEETLDRLD RPTVRYVFVA AHLPPYRLTEPQELS
NRLRPVVNGRPVGEYVDRLNRLLEVL MRHRKVALLCGHDHCYARYLIDRN FPM
YPKGWRGRDIRREPWFRPLWVIIDGNAGAPMFTLADSPWKDRVRVFTTRS AVVVL
FHVRFDRIVVEAYDATTGERVDRFEIPAPG

50 <SEQ ID No.:1362;PRT;Methanopyrus kandleri>
VATLLEAPRIVERWLRGMEERGEYEP AWGDREDVYSVALAGVLHQRTTRRELAEPV
LRELLRRYPEPSDLLKAPEDELKESLARIGLVERRLKAVLGLARLLSEDPEPSGEDLL

SVPGVGPYTADLVRAVYRERVLPVDANVRRVRRSTGRPVGDVGAEWVRAARD
PRDLALGTVELGRRCCRPEPECEECPIAGVCAEQGRVRG

<SEQ ID No.:1363;PRT;Methanopyrus kandleri>

5 LYTFVVELSIATVLFISVYLLAKSVGFDRDRAIAASVLAASGMLPQWEWGGTYPMT
LSFGFGLLALAMRDRRILAPILLTSLYSHPLGGXXXXXXXXXMLLWGAFERRPGYAV
SVGVAWALALPHYAFFLPYARWLSTLIDSPAPDELFRMLLLPFPDLVSPGAFLLALA
GLGLWRARREPWARVTGVCWALAWGMVAAYALGLTRHLPFGRNLLDRFTCVLIT
10 PLLALPAAYMLRDRARHVRIASKVLLVLSISSAALPLSDSLSCELPTVPGSADVVAWV
KEHRSHDPIVRVEFLLATKRYGKPHNALWVGPRVKGFFAQGDPYFHALTERMWE
GFWWYDPEFVRTVCRLCNIEYLWVSSFTVKSGMAAGLTPVYKSKWIRVLENRRIA
GAEAVDPIGVYDPRSVREVKEYTTALNLVPKRGYRYIFAVVEDPRELSAFRKVLIR
PESPEDVRLAVRLAREGKRVLLVLPAGDDRIAREVSRELGVHPKPAELRLRPYRK
15 PILPRSLRTTLILKGPKRSEKVPPGYQVGGGWFRDVRVGRGTVRVVGVDLPVVAIR
LHPTYVNVGKDLGKIPPLPGPHERRLYSRILDGFGSLHPIPCRFDPARSARVEVIPS
GYQWALVKVHFPAWHASGGRILVGPGGTMIVRTHSERVILYFAYPTRLYALGAVG
FALGALALARPDVLSVIPGQRPESD

<SEQ ID No.:1364;PRT;Methanopyrus kandleri>

20 LAERPEERQWKWEWEEAGLFEADPDRESVYITVAYPYPSGSMHVGHARTYLVPDI
YARFKRMQGYNVLFPMFHVGTGPVVGIAERIKEGDEDTIRLYRDLYGVPEEELEKF
TEPEAIVEYFAREYEENMKRMGYSIDWRRKFTTVDPEYRSFITWQYLRLREKGLVD
KGEHPVRYCPHCENPVGDHDLLEGEDATIEELTLVKFPVEGDDLILVAATFRPETLY
GATNVWVKPDEEYLVVEVDGERWVWSEEAYRNLRHQKDGVEKVDTVRGEELIGES
25 VVNPVTGEALPVLPAEFIDPKFGTGCVVYSPAHAPADAALEDLKKDPSVLEEYGVD
PSVVEELEPVQVIEVEGYGEFPAYDALEEHGIESQTDPELEKATQEVYRAELHKGV
MVVDEFEGTPVREAREEIKSRLES GDADVMYDFSEKPVICRCGTECVRLKDQWF
LRYSDGEWKERAEE LLGRMEIVPEEVANFEDTIEWLDDWACARRVGLGTPLPWD
PDWIVEPLSDSTVYMAYYTIAHRLKGKGELPPEVFDYVFLGEGDPEEIAEKAGLDVE
30 ELEAMREEFEYWYPLNWRLSAKDLVTNHLTFFIFHHAALFPEDKWPKGIVVFGMGL
LEGQKMSSSKGNVLLSEALDEYGPDVVRLFLATSAEPWQDFDWRDEYVRGVQR
HLERFETLIRDHADESVEDKDAVDRWFLHEFREVVEETTEALEGFQIRRAYNRAFY
GVMKLLREYEAMKGHV KILGEIAEDWLKLLHPVIPFATDRLWREVLGEDSFLLEEEW
PDPSEYPEEPELSVAKEVLDRLIEDVRDVEKVIGAEPGYTLHVYLAPEWQWRALALI
35 LKDKFGEVMSSELMKDEGLREKGDVAKIVQELTKEDLPEDVDVDALREALTEFLE
AAGRALTDKTGASEVVIHTDPEEAPGPEDRKAGARPLRPGIWLEE

<SEQ ID No.:1365;PRT;Methanopyrus kandleri>

40 LATVAVLGFNGQRLYERIGAAEKLGGEPFPGGAAMAIEFAEAGHDVVLADPNLSEQ
DPEHVDRVADAGVELTEDDAQAVEGAEMVVLFTFPFGATGGIIREIASHLEEGAVVCP
TCTSSAFEIHESLYEAGLEVPEAVGVMPAHPAGIPGTENHRAITARGTNGTTLAT
EEQAELVEEVLSSSTGKEVFLPHVELSVVGDLSVLLKRVIEALKEFCVVKALGAP
QEMIDRQAMMTLATLAALIEAGGIGLLETLDDEEAIEASYSNMEPFVDGVEEPEGEP
VERFVVLPGEATREAVIELVGERGWRTVRMRWVDLYKKH

45

<SEQ ID No.:1366;PRT;Methanopyrus kandleri>

VSLEEVLDEIRREVTPDPEERELVEGFARRILSEVRDRLKERDPDAEVELIGSVARDT
WLP GASD VDVFCVFPKDRDLDEIVEVTLEV GREAI EALGGEAREEYAHHPYIGGEV
EHRGRTFEVDVPCYDTEPGEVITPVDRTPHHNRYVEEHLEDTEARLLKAFVKAID
50 AYGAERVVKGFSGYLCCELLAIHYGSFEEVLREAVRTWRPGFVIDLEGFVGEVYEDY
DEVRETFEDQDPALIVLDPVDPERNVAAALSRRQLTRFILAARAFLGDPSPEFFRGR
KPPEVSGEKVRDWFERNPTHVVAIEVRLPDEVEDIYWPQLEKTARSLSRVLENEGF

EVRRWVHVMRDSEEEHGYVLLEFEH GKLP ELEWRVGP SGWVREDRVRGFVRAHG
 RFWVEEDGKLATRAERKFVRPEDLLGRLEGADRQTLLSHGFGKDLARSSEGEVRL
 LSAEELAEADRDP ELGKALAEFMRGDPLSELVRDRL

5 <SEQ ID No.:1367;PRT;Methanopyrus kandleri>
 VSRFRAFISIDIEEEVNRIVEVQERLKASGADLKLVEPENVH LTKFLGDIPESRV T
 DVVNAMEKAAETVEPFTMRLKGIGVFPNPNYVRVWIGVQEGSDETKAMAAVLEQ
 ELGRMGFRERKDFVPHVTVARVRSGRNKGR LIEAIRELSNVEVGEVEVDRI RLKK
 SILRPQGPEYHTVEEVEI

10 <SEQ ID No.:1368;PRT;Methanopyrus kandleri>
 LGYPVREPGMGKEVVDSLEAFNAYAREQWLG EVVREGTILFDTGVVHSYAFKVV
 RVVPSGMGRITSSSTRFVLRTRFEEDRMEIPNLTLDDVVGHEEAKRACSL LVEYLKNP
 EEFRDWAPKTVLFYGPTGTGKHTARAVAGEAKVPLLHMNAAEILGKYVGEASERI
 15 RRAFRARKAAPCVFFLDEIDALALDRRYQELRGDVVESVNALLTNLDRLKNEGEG
 VVFIAATNQPDILPAVRNRFEYIEFTLPNKREEREELVRYYAKKLPMPLDVDPYIA
 ARTGGMSHREIKERV LKRALLEALREGAEKIERKHIQKVLNQERERRAVRIYHR

20 <SEQ ID No.:1369;PRT;Methanopyrus kandleri>
 MSRKKSLVEMADLHGUACKLPQGDLEDLLKGVELPEEGGRVEVGVGD DAAVIRVD
 GGYVIQSVDFFTPIHPDPYTQGRIAANNSINDVFAMGATEVLSVLVSGFPRELPEE
 DAREMLQGFADQCREVDALIVGGHTIMNPWPILGGCVTGFAERYVTVGGAEPGDV
 LYLTKPLGTQPAMAAALRLPEDVRKQFLT DSELEEAVDLAVEVMTEPLKDAAEALEV
 25 GVHAMTDVTGFG LKGHAGEMA EASGVRV VIERLPVIPGTT ELSRALGYGLERGES A
 ETAGLLVAVPEEHAEDLEDAFERRDVWYRRIGRVEEGSGVEVRGDVEEVEDYP

30 <SEQ ID No.:1370;PRT;Methanopyrus kandleri>
 VLGKGRPLVVRGRTVEQVWRQAVTG IKVHGEKVERERGPVKEVRGLIAHLEPSGP
 ESFDIPDDYPLDEHSVRAYEDQLLDP ELRGFEYTYGHR LRRYFGLDQVTKIVERLSE
 SNNTRRRAIAVTWDP RRDLDEEEVPCLTALQLQSDGSGLELHAFYRSWDVGKALV
 ANMIALRRLQEHVAERAGLEPTTLTVYAANAHVY EEDLPDLP

35 <SEQ ID No.:1371;PRT;Methanopyrus kandleri>
 MKTGTWRVKTGFARMLKGGVMDVTNVEQAQIAEDAGAVAVMVLEKVPADIRAAG
 GVARMC DPAKIEEIMDHVTIPVMAKCRIGHVAEAQVLEAIGVDMIDSEVLTPADEE
 HHINKWEFEVFPFVCGARNLGEALRRIAEGAAMIRTKGEAGTGNVAEAVRHMRIRRE
 ISELTRLDKEELYGKAKEYGVPFDLVAEVASLGRLPVVNFAAGGIATPADAALMMQL
 GADGIFVGS GIFKSDRPQEMAE AIVEATAYYDDPEVVAEVSKNLGDEVAMRGLEISE
 40 IPEEERMQLRGE

40 <SEQ ID No.:1372;PRT;Methanopyrus kandleri>
 MISEDSGSNEDREVKIAVIGPEDAGKTTVVRQLSDKFTTVSPRGKTVGIDFGKCKYY
 EGVYMF GVPGHLRFKFMRLGARNADGMILVIDSADPRIDKAVKIYNIVKSVVKNPH
 RVVVFANKQDLPDAL SPEQVGELVKRALGISPPVIGTVAIKGEGLREGLD TLLFQPTY
 45 NGTNEIDDIEIKGIR

50 <SEQ ID No.:1373;PRT;Methanopyrus kandleri>
 LPVPVKNRATLAQLMLSYGITICVDEDVLRAINEMTFGQLPMILDES VNVPLEYEENII
 DAELVS LLEFGEDMVSSLLDMIVVRVNAVNGTGTPWELLNTILLADNPGKVELNGS
 YFSIFAIDERQIVYISSSGRRRIPYTDLT YMKDISEWVNARNIMSPNYAYIYDESALNIT
 EDVLKKRYRASIKGLSELLDRPKHWVRIDTTITEKKGILIRDRLLDWIEPLEFTKITVR

RDVDEPAIEAITGESKVNKVVYALRVFREIKPGFKTYRELV ERAQLPDSIVKSTLALFTR
FNFLMYSFKYTPPII

5 <SEQ ID No.:1374;PRT;Methanopyrus kandleri>
VPVYKSAGVEYKPSLYVIPMCFQGDLIAGELAVATLLFVIIVGSLSLISLRNAIHARDK
GRVVLHIGMLTFLASFTYAAFRMVQSSLFVPVGPPSPRTVAVPPAIVSGNEINMVFV
ASLIGLGLVVGAIASMTTRIRV

10 <SEQ ID No.:1375;PRT;Methanopyrus kandleri>
MSVTKVYFVGAGPGDPELMTLKGVRVLRADLVIIYPGSLIPRESVEEWAPNAELIDS
HGKTLLELVETMVEAVEDSRTVVRLVSGDPFVYSSLYEQVRELRRRGVDYEVIPGV
SSVNAAAAALGEELTKPGISQTVILTRPAGRTGKPEGESLSLAHGGCTMVIFLGAA
YLERIVKSLGGAYDEDTAAVVYKASTPEEKVILGTLGDIAEKAREEGIDRTALIIVG
DVLKEEGKRSHLYSEYARRVRR

15 <SEQ ID No.:1376;PRT;Methanopyrus kandleri>
MIVGKLYVGTGPGDPLMTVKAQRVLRHVDDVVVGYRTYVDLIEEILPEDVEIKRYG
MREELDRAREAVRLAADGFEVALVSGGDPGVYGMAGVVLPIAVEEGVEVEVPGV
TAACAASALLGAPLMLDFAAVSLSDHLVPLEEILERVRAALEADFLVVYNPNSSER
20 RHIFEAFVDVLEEIVEEDRPVGIVRNAYRERQSVEVVRVRELRLDLADRIDMRSILIVG
SSRTRMVGDWLVTERGYSSRTGRNSSE

25 <SEQ ID No.:1377;PRT;Methanopyrus kandleri>
VGGVPRFWRSIDNRYRLVGTRCKNCGEVFFPPRVVCPNCRSDGEMEEVQLSGRG
EVYTYSVVRVPPEGFEDKAPYVVAIVKLEEGPLVTAMIVDCEPGEIDVGTPVEAVFR
RISEGEDGVIYYSLEFRPVREE

30 <SEQ ID No.:1378;PRT;Methanopyrus kandleri>
MVCVRFRRDVAIVGVGMTRFGELWERSFDDLVEAGLEALEDAGMGGDEIEAMYV
GNMSAGRFDQEHVASLIADRSGLTPIPCTRVEAACASGGLAVRQAILAVASGMYDI
VLAGGVEKMTDVTTEEATATLATAADQEWFAFHGVTFPALYAMIARRHMYEYGTTR
EHLALPPVKNHRNATKNPKAQFQFEITVEQVIESPLVADPLRLDCSPVSDGAAVIV
CPLMAKEFTDTPIVVRATAQASDSIALHDREDITTLKATVEAAKTIVYKQAGVEPEEV
DVAEVHDCFSIAELVAVEDLGFVEKGEAGEAYHEGMFEIDSDYVAVNPSSGGLKAKG
35 HPVGASGVAQVVEIVEQLRGEAGKRQVDGAEIGLTHNVGGSGGTVVVHIFERAD

40 <SEQ ID No.:1379;PRT;Methanopyrus kandleri>
LIPSERVGIVGYGAYVPRYRIKAEIEIAAVWGDDVDSIKSGLMIEEKSVPSETEDSATIA
VEAAKNAVARAEIDPKDIGAIYVGSESPPYAVKPTATIVAAAIGATPDLTAADYEFACK
AGTAAIQTCAGLVASGMIKYGLAIGADTAQGAPGDPLEYTAAAGGAFFVIGRKKLVA
EMEGTYSYTTDTPDFWRREGQPYPRHGGRTGAPAYFKHIIIRAARGLMEELDLS
EDFDYAVFHQPNGKFPRKVARSLGFEPEQVEPTIVVDRVGNTYSGSSLLGFTAALD
RAEPGDRILVVSYGSGAGSDAFSFFVTERIEEVREKAPLLEEYLEDVYVTYGEYAK
45 MKKKLKF

50 <SEQ ID No.:1380;PRT;Methanopyrus kandleri>
LNHPRGVISLPRSLVLKRIVGDIAASEHPGKVMRKWRKV FHASQVEVARRMGVSPS
VISEYETGKTKAPRVDTVRKFEALIEIDEERGGNIVSALENVLFSEELLVTIGIGEF
YPRKLEEVYEAEAPVVHGNVDVFGYTVIDSVK TILEVPARSLIRVYGECPNRVLV
FTRIDRGRSPMVAIKAAGVKPSAVVLHGIDKSEVDDIGIKIAEVEGINLATTTESISRIS
KRLKELTEVQPGDRG

WO 03/076575

- <SEQ ID No.:1381;PRT;Methanopyrus kandleri>
 VLDGGLTLLVLTALALFRERKKRPQKVSVIPAYNEEKTVARVVRAAKECDLVNEVIV
 VDDGSEDRTAEAEAGAIVISHSVNRGKGEAMKTGLKHASGEIVAFVDADIKNIRP
 EMIEKMIRPVLEGEADLVKTKFKRKAGRVTLLTAKPLLRRFFPEVAHLEQPLSGQICA
 5 RRKLLERVDPEPDYGV DIGIILDAVALGARIEEVDIGEIKHEMQPLERLHRMALQVVR
 TILDRAHKYGRVVLRWNVGKALNRMNLGVSLALALATLFYTELPLASVLALGILGLG
 IALFSLAQLVYELLRVEGKKRRILRPFLMHASVIMSLAVVAVLVGAMFSSIQIAHDRV
 EVNPLPRKVWVGEREVKAEGPYVQYGRELKMGRNVLVLDLKPDDVLVYQRGE
 YRVESAGRDNLLMVPTELARQLGIKPGNATDSEIRLAFRNITVKKRVEGPDVNIRVT
 10 AVLSATPDRAEALTYYVDGKKEAWIPVATRGGSVYVYVSGYGLIKLEDRSVVYVGN
 REILLKLEDTDIETLLLAPAEPTPFVIELKMPSVRVAVE
- <SEQ ID No.:1382;PRT;Methanopyrus kandleri>
 MRELLAVEPSPGADLRVCLTYPNEYRGMASNLGFHIVHRILAGIPGVSVERSYVPTD
 15 AYKSLDPNRTLVSLETGSPLEFDFVGFSLQFELDYPHMLEALVMGGIPLRREDRDE
 NDPLVLVGGPCTVNPKEPYVDVIFYVGEAEAGLEEGIEAILTARDRRDALEELADL
 PGFYVPEYPGTVDRVTNNLGGTEPPKIAFAPEDTEHTGLRAYPVELGRGCPYRCA
 FCLGGFTAGHMRHRPVEQLLEVEDVEKSPYDRAAMISPSPTLHPEFEEILEECLER
 HLEVSLPSTRINDLDPELLPELREAGVRTLTAPESGSEDVLEFLNKPPLHRDHILLELV
 20 EDAGRLGMRVKLYFIVGIPGFPEEDTVASARLARECAELADVRVSNPLIPKACTP
 LQYSEMLSAREINRRYRLFEREFRGRVSFEDPELARAQCLLSRGDVDVSRILEEVL
 WNARSPGAWARAMRSHGVSISPDRPPDGPEDVPYDFVRAGPDHEELYRLFTSLQ
 CAPMK
- <SEQ ID No.:1383;PRT;Methanopyrus kandleri>
 25 VSPLNRKELLRRVLKEALATGRYMALGSMDGVLASMGAVLSVARGGSAQDAASA
 GLSVAVALALSNGFGSYLGEKIEELREIRELERQMIMKRGGLEHTRVHDLARIRIYTS
 VVSHGGSSFMASMPILPVLIKDPKWSVIACCTVSGIFLFLGVYLGRLCKERKKDLI
 LRGCEAAIGGLVGLVTHFMGAH
- <SEQ ID No.:1384;PRT;Methanopyrus kandleri>
 30 MAKIRRLVLDVMKPMEDTTTELARSLAKLEGVDGVNIVLVEVDRDVENVKVTVVEGP
 DLDFERIKDLIEDMGGAIHSIDEVVAGSRIVEEVKTPQDD
- <SEQ ID No.:1385;PRT;Methanopyrus kandleri>
 35 LSTWHPRPGPIPAAMYTLRDLLADAVVLHGPKGCCFRTARLLEKDGVRVFVTGMEE
 DDFVFGALEKLVELLEYVEERLEPELIGVVGTCVSSIIGEDLEAAVEEADVDATVTV
 EVHNGMGPNTGVRTLERAAGVPEGEVERQKRLMRAAAELERRRGMASREY
 LEPWSGHDPSEVARVLLSSEDVLAILNAKKETAYLFADPVLEVKGKRGAWVLANLSP
 40 ESGLPKVRRDAEVIGSIFREEGIEFEVTGSLDEYAVTGELLAEKIEEFPDPSVLITGIP
 HAVAPEELDVDATFVAVTDGLREASALRELGYDVVVEEEAHARVLGRREIVPSDL
 GEAIRQLSA
- <SEQ ID No.:1386;PRT;Methanopyrus kandleri>
 45 MLPSSPSCRCWLRAPRRPHRVVLPALVSANSVGALTPLGNPQNAIYSHYRVDVVD
 FFVTQLPVCAALLAPGLLYAWVRGERVESGSGSAPNVLDVAVVIAAAGCLLAHVPV
 YFWFPAVFGYYAVLRPHAVREVDWVVIGLLTVGVLVPSVIGSLGWNPRVDDPFVW
 SVLLSQVSNVPTTVLVPMDDWRDLLHGVTVGGYGTPVASVANLIALRAAGSRG
 VLRDYAVLQGSCLMLGVLSHYALS
- <SEQ ID No.:1387;PRT;Methanopyrus kandleri>
 50

5 LERSLLIKITLGAVAGAIALYLTFLHLADVDEVLRALQRADVAWILAAGACEVLWFAAC
VEGWKKTFEPLGGRPSRRQLFLMYCVKLMVNNLISLARVLGDAIRVYYGIRLGWSA
ATVIPTIVADIVLGNAGYLAVILLGCAIWWCCTEVSPYLIAANGVGAVAVAGLWALFAS
ERTCHEAYESVRDLVEALVRRVGYSVGTVDDELVDSTVQLFRSKEARLALLQYTVGW
AARVLRLYCVTWAWWPTASPLIPLVMSVAIRGSVVSVSPGGLGIVEGLTTGVLTVL
EADPSRVMAALLLDRLYSFVIPVALGAVSVPVLERYVGRG

10 <SEQ ID No.:1388;PRT;Methanopyrus kandleri>
VELYHEVIMLKDIAALADVHVGVIEILRRRGIRAVDRTEDRVEKLRRRCLEALDPSILVI
VGDLKHNVPFASRIEFRGVPKLVDAALEIVDEVIVVKGNHDGLVEELLRNQRGVRV
GTRGILIDGFYFLHGHAEPDPELLSRSDLLVFGHEHPISDAVPGVSVKVLVELEDFE
ELTRGEVSGRGPGFVLPADFDDLVGGTEVTSDDRLLLAHRRGAVIDESYLPIPEAEFP

15 <SEQ ID No.:1389;PRT;Methanopyrus kandleri>
LAKVRVGVLGATGIVGQRFISLLADHPWFELEAVTASPRSAGKTYAEAAKWYLEEP
MPEDVAELTVLETDPKEVEREADVDLVFSALPSDVARVPAFAEAGFAVASNASA
YRMEEDVPLVVPEVNPDLGLIDVQRDERDWDGFIVTNPNCSTIQMVLTCLKPLMDE
YGIESVVSTMQAVSGAGYAGVPSMAIIDNVIPYIEGEEKMETETLKLGELEDGDRV
EFADVKSASCHRPVLDGHTAIFVATEKEADPEEAAEVLGFRGVPEKGLPSA
20 PERPVVREEEDRPQPRFDRDVGGMVVVGRIRKDPVFGGLKYVCVGHNAVVRG
AAGASVLNAELLVEEGYL

25 <SEQ ID No.:1390;PRT;Methanopyrus kandleri>
LQISVIGSGRASEDLNLAEEELGREIARRGHVLVCGGRGGVMEAAACRGAREEGGIT
VGILPGERRDEANPYVDVVIPTGLGEARNALVVRAGDAVAVAGGWGTLSEISLAKK
MGKPVVGLTSSGGWAEELARRGEIEGAESPREEAVEKAELLAGYR

30 <SEQ ID No.:1391;PRT;Methanopyrus kandleri>
LDEILERVRRERVEEIRDRTFTPRAGGRSLRKALSGPGVSVIAEVKPTSPSQGRLRDV
DAEDVAERARAYERGGAAGISVLTEPEFFDGRPEYVEVVREAVDVPLVRKDFIIDPV
QVEESAHYGADAVLIIAAVGREAPELIDLAHEHGMEVLLIDRWEHLELLSECDPD
VVGVNNDLRLTLEVDLNRTELGPEVKDLTNAPLVAESGVSGPEDVLLGEVADAV
LVGTYLMRAPDPSEAVRKLVEAGRSTE

35 <SEQ ID No.:1392;PRT;Methanopyrus kandleri>
VIEPYKLAWSVVFGISRGLYVFAGSFIAAALRYVAEERITMTTAMFVGLITAGFASG
PQKLAALAI SQPNVEVLSWTIAALFAIPARTYGDALGKRLL EARLSSMKPTTKVYRLP
EDPDNIEDVPGEPPAPREVKKRIAGREYEFPRGTPREDVERVIKRDLEEEGGVGRA
VVRVDGDEVKVRLAGAKPPVSHTLPPDKVAVSVKPKGGS AHIGEGDKVIVYADGQK
40 LCEAEVWKRSKSGVVLVDREHADELMRLVTKGKDVSLVVEPTTE

45 <SEQ ID No.:1393;PRT;Methanopyrus kandleri>
MSANDHPIRRPVAVYGVHGDEGRALEPVVRRVLPEGFRVSRVFENGYPVSTVDPS
FHRSEVGARWRRVVEDLRPFDTYVELHCYRPRAYRKLTAERRSGGVPLVDFGA
GVLLGSVPRQHKRILGDVLTLTLEVPRRPSDRALRVVSEILGLIPGRTRGEFVKELRR
RFPEATEEALRRFRSYYPDRDPF

50 <SEQ ID No.:1394;PRT;Methanopyrus kandleri>
LRSWFPHAPT VSVPEIEPEEALS YRDEIRTRVRSYAFGLDDWR AKVKTRRAYLRKV
RDEDESEILRVYGALLTVAAAGPRPVRHLIAEGESAMAETALYALRHEDESAMSYPE
ERVLSDLYLWDVRVLERDLGLYAVHFSFPLIHRSP EGQKLKVLVWERASLEKVLKEV
RSNRVLGVRVLDPSGWNVWICPRCGATRRGGTGDLEQDHARRCSNCRGRMRK

PDPNLLLEMLKEPEGYLIMHFCTLARTFREDVRRLVVS DIESRDDVEDEELREFCLKL
FPKVRKRLERVEKGAGGRFPFCIRELLRAQEGENLPHEARFALAAFLVNVGWDV
DRVVEVFSNLPDFDEERTQYQVRHIAGEVGGGTRYLPNC DKMKAWGLCPGKDC
GVKNPLAYYYRRPRADDG

5

<SEQ ID No.:1395;PRT;Methanopyrus kandleri>
VSLRCPRCGGPVRPSLDRLECEEECEWSKELRSRPRKDTRLKWMKEYARRFLREEF
DDCGVSEVIVRGPRGKGAGYLAATVYVDDHHAIGKDGSRVKEVEEKLET LADELG
VPPVRITVHPSSALGRR

10

<SEQ ID No.:1396;PRT;Methanopyrus kandleri>
VIRYIVTVLVVASLLAAPVAAQEGGTTTGTGQATPAVQPSQPAPGGTTTATGGGGH
AGVSQPQPVSTAGKAQKVESGKKAGEAKKKKEKRRKKPEKKRTRKAGLQGLTRSL
RELRYALATAVGLAIMAVMMGYGLVKFERRLSQRSMKAKARKAKKTRKPPKVER
KLRKTEPKKEEVERVRKLWKQVKEGD

15

<SEQ ID No.:1397;PRT;Methanopyrus kandleri>
LRTVRRALRRGEPVFIFDSEDREGETDMVFWAPEVTPDHVAELRRTAGGLICVVIHP
EHAREIRLPFLVDVYERADHP LLRATWPDDIPYDERSTFSITVNHRTFTGTVD EDR
ALTVRKLAEFFTRNHEDPVREFGEEFRSPGHVHLLRPFDGLLEERRGHTELTATLLE
LVGLEPKVAVICEMLEPGGGALPREEAERVARER GAPFLTGEDILKAWKGGER

20

<SEQ ID No.:1398;PRT;Methanopyrus kandleri>
VFTGPVAVGEYVEGLGEGRRYVSIPYYRREIERVIGARPFPGTFNVRVEREERESL
RELASSYGYRIEPHGEYGGAWLYPCLVNGRPAWLVPDLTEHRDQVELISETELRR
ELNVIHGDMVKIEVWGPSTWKLARRLT CGPSGGR

25

<SEQ ID No.:1399;PRT;Methanopyrus kandleri>
LEQLGRALLETVQKDDPEPFLRALEETEVDPEDAERFLEALRIQREKGRISDETLEA
VEDALFKVSESEEREIPEPDPLAEYAGVDRLGTIMTGKEADVLLAERDGEKVALKVY
RAHTGYEERHEERVYRLEDGEVRRIERGDAALREFSRLRRAYEAGVRVPKPYDAR
PGLIVMEYIPGEPLYRAPDLDDPGSVLEDLLDQVVR LAVDAELVHGDL SAFNVLVGD
DGVPIIDLSEAVKVKEPGAFETLRRDVKNLVSFFERKYGVSA DVDEVVERVRRGV
YGTDRGRR

30

<SEQ ID No.:1400;PRT;Methanopyrus kandleri>
VRLHVATEDEIRRGETADVYFRRIRKVLEEEGLADTEVVAEISTRSLPEGWEWGVLC
GVEEALALLEGRDVTYAMDEGEVFRPGQPMRIEGPYVEFCELETALIGCLAKAT
GIATKAARCKVAAGGKPVYSFGIRRHQHPAIAPMVDRAAYVGGCDGVSGIKGAELIGE
RPVGTMPHAFVLVFGDQRKAWRAFDEHVPEDVPRIALVDTMYDEV EEAALMAAEEL
RERLDGVRDTPSSRRGDMAEIVREVRWELDLRGYEHVKIMVSGGLDEGEIRRLAE
VGADAFGVGTAISDAPAVDFAMD LVEIEGEPRSKRGKLSGAKQVWRCPNCLDDVV
LPRGKEPSPCPEGSEEREPLLRFVEEGEVVREP KSPKEARRHVLET VGELEGLDL
TE

35

<SEQ ID No.:1401;PRT;Methanopyrus kandleri>
MSRKALMPCTGMSPNGFVSRVVAELSEEEGIPSICPPATAAGKEKFLELLKRVEVL
AVAGCDYNCPARILREKAGKEPSETV FVSDVSEETGVDADSLYELTEANREL VKEV
KRRVKELL

40

<SEQ ID No.:1402;PRT;Methanopyrus kandleri>

45

50

5 VRAVFYLLPLYIKSDDAWELGRLLRALDTRNRRVLVLDRARSFVHNLHQALRDAERI
RSVEDLQQFAGQGGGIGVAEIIKGLVGADVHGLEAMVVCRTYLSNYAAQRSIIVPIM
LHKIRLEPKDVFDNPLDALRLEALESVLYDLAIVAGRAVRSEGDEYPFTVLLGAGTV
VRVAQNYPDHAMEIYENFVETFKDELDPEVRVYDLGSKSEVPLEELEDVEVKKFEE
LSEDERKELVNWMMNGQIAVR

10 <SEQ ID No.:1403;PRT;Methanopyrus kandleri>
LSCGEDKEVLFEALDAVEEKYDLRKSQYEMLEEIRDQLAECDSVAVLTTRPGSGKT
WLLRRIAREYRERVFYSPSPDLAEREYKKFKEWELSVDLWRRVEDYDEPCQVKL
PELLGELEQEELFEVMAHAGSAQDEPKCYPWFYRKEGPLLKPLEDEELREKVRRAL
YRENPFIKGFAPWDSCGNCEIIRQLREPARIVCLSFKKLLSAPFLYASHRCAREALGK
EPFVSEEDWEEALEGSLVLDLDAHVLPALIVEIRGYVRVGSRTLMDLKDLDLQDQ
HMWSVVDWNRDVRKVKKALEEKTKFREYDRLTYELEDWIEELRELVRECRADY
15 LDAKKNLSELLNELIERSEEAGIREWVVVKSPPRRGRPILTFAPVVKNLQELLKLLMGPE
YFELPVAYLVAENRPTLSELDRRGVGV

20 <SEQ ID No.:1404;PRT;Methanopyrus kandleri>
VERLEGGGVSVNVVCGHFNHGKTTLVKALTGEWLDRLPHEREMGVTIEPARAF
LELGDTTVSFVDVPGHRDYIRNMLASAWSADYAILVVADEGPCPGTIDHALVVSFY
GARVLPVVSVDLVSRDRAAEVADEVMDLLELLGVEAVVEPVVSAKTGEGAEELL
DALAELEPPRPSEMDPLRAPVESTRRVDETTVDVFGIVDRGTLEEGRVEVQPGGR
SAEVLEVESTDGSFGVPFRARLRVKGSITRGMCLGEGSTADRIEAEVLSIGAKVR
PGTMGKVHVLAAANVRFAEVETDAGTEVLRPYAEGHNVAHVLELDREVVEPG
25 DRFLVTVGNEPAVLGVVEGVAR

30 <SEQ ID No.:1405;PRT;Methanopyrus kandleri>
VPRPLLVLSELLPALTSFAPVSCGEIVVISRYAGQFIEPLSKSGVDFVIDRSYDSLIV
GANLEEVRKETCERIRNASAVLYRSSGLTSLDPYSAPEYAALAEALSRGVPFYVYQ
NGINIPTGSTKAEMVPLADRVMMNVGGAEVPLYLFTTLSENLVQFFRYVGGGEP
35 RAFYLDGLLSLYDPLTDTTVSYDRPVDPIVILRYQREFPHGEVLSSYHGITYPRWF
VELIRGEVLPRLEIFDRYRRLGESRGFYTPGAPTIVFVFDSSNLLGRYLGYLWDLR
VLAEKLHERGYNVPIALHYDALYMLPEDFLGALEPLVKEEHTVCIMWAVNHSMR
YYGPD SRLVRLFERLNVPIGLDSNHMGMTLQWECLYMSERAADHYMFNVIAP
ENLGFLGLFLVGTSRVRLPPGLARHVPGGVLVVRGKPIEETIDAVVRLVEKLRLR
40 EAPNREKRVALVYGVDTSGRDFVAVADQLDVPASVLHLLAWLREDGYSVHTPWDE
VLRRVIELDREAWELLERGNFRQAIEIFREALNVLELSDRFWREYLFRAHYVGPYV
RTPPLKTGLNRFVERAGGRAHEVELLLDKVTLDEYLEWYRSLPEPTRLYVERGILG
YLRYLVERANPEELPPDKRYLEFLRVRMEALMDTVISCLHLMNLDDATREALVRKLR
EVFARVTDLLVRVSRGERVDKEPVLRELDGLWEEWRGRDELGGLFGWGPPEES
45 PFLRTVDGTRAFPIPGMKFGNVIVLPEPPLRMKSETELRASVLPPTHLYLAFWYYLT
RKFDADAVVRVGGGRLEWTPMKPILPLGWEFPIVLANGTPIVCLYHVGDPGTGCVT
ARRRLGAIVLGHFPAPRNEVQFDPEVERLIEALEKYLQSRSPALRDAILELVRETGVY
LVVTDEWEKFERNFDRCAELLYEYLREVEEESGMCGLHVYGLPSIDPEDPFKSLEC
MVEFALRRALWEEVDVDWEAVWTGRQGDRI SRLAREVLERFLLSARYEIEENLLRAL
50 RAEYVRPGFGGSPLRYVYVAPTGRNTCAYDVRFPDEVAVSVSSVIATELYRHAED
RVMTVMGPTDLATGGLQYALALELLGYVPVKTSFRSYVPTTTGRASYGTNLGTEVI
GVLPWELPLVHVRHPNVVQTLIRGRITEVRYLGNRPVVDGTAHVEVVLPEG
TRVSVGQELVVLGIPDFAENVRLLCSDLVISYSEEDVVDVADLVAMPTVCGGTSAC
VSGIVARILDDHTVVL RSEYDPSASITVAFRYPVNLRVGERVVVVGELTFDLRTVRIV
GVEVLDLPRVRKDVLLLVSGATFQGISPSALSINVCRLMDVVAEPWIALALGERS
YLSPTARPHGTGRWDALRDVLEALKRSLKEAEERLRDQGCVPGLRRLDDALTRL
ERDPLGTLRELHEGLKELNDYVVGLRDLVGWNLAELLWSVAVGTGLWIPPSRNAP

- FLHWAVTYLVLREALERLPDWLLGGLTRENVAVMAGVAVFTQCPGEFIAPVLPmie
 AGMYTGDSVESLGLRALVGFSYTVLPYVRSELVGTRQPFHCPALALAVVTSdav
 LQVFDSDYDDSNLFCCGCTVDLEASARALLDYLLRENSIRGWTLdVSKVDLGafkp
 GWNVAKSAGRLARLVGWKETLLRAASGLKETLREIERGSGPLVSTRAYLVRSllrt
 5 LYNRSFIAGLRRFGVSGALYLLRSLKRFATLGYYAIGRRDLAAVLPVWWSAVGANAD
 WLASVPTALASAAFLSLARISTDLGVPPYPREVLWITSVACCCPELCAFQTQVVERMA
 TEAIETATAVPPTVPTARPTFGPTVRVAPRVPVARITVTVSHVAAVTGAVVGPRSA
 KPTGVSLIGVAGKVTTGGAEKDAGSTAARTGRVLAQEYRAAPVSYPFRWLLVLallt
 GCFLAVWWARRYEPGPRGW
- 10 <SEQ ID No.:1406;PRT;Methanopyrus kandleri>
 MGILRPLVLALVTVALSTAPGSAITAEQIQECARAAHDWLKSQQYTEEDVGKvieYK
 DRSGQKATYEVKPEDVGAFPMsyKSDVYYCLPNLHTYVVMdTLTAVEVGYPVD
 KDMVLKALQYMWNVKGKYQRKEDPNGEWAYWARIKDGKEIPSAGLTAKFALPFFR
 15 ARQAGIVPDDKWNEYKPFLEKVINWLREGPNLQKEDKGYCWIDYPDRPGGAHGIT
 DVTSYCLRMLLAAGTSPDDELILKVVEWFLNNQDEKGNFYTDPRDTGCPYPLYTTG
 HCRAMIALCDWLEAVQRAGKEDELKDLVERVKNALKKAIDYLLSLRDPETGMWGR
 GSLSEYPPDYGSTASALVALLRCAKLGLIDPNHEAIVKALEVLHGQYLEAKRLRlPFY
 WYFIRSVWSPELRYRSQTLATSYALAAFALEKLGVGKGWVKRKIFPVPVAVVALA
 20 LAASLLTRRR
- <SEQ ID No.:1407;PRT;Methanopyrus kandleri>
 LSGGRRLDPLGAFVGLLTEISPYLLIGLVGAALQSMVPERYLARHLRGGLKACIIATL
 LGVPLPLCSCSVLPLAIAAKNRGAGVGPVIAFIVATPQTDVNSLLLAYALLGPYFTAA
 25 KVLTAVVAIVGYLAELTLKDRSEETEELPSCGEHGPCYGRSFKDFPRELLELSG
 TVGPWLLIGLAASVLELWVPSPAVRYLEGFLGPVLAALISLPLYVCSVAIPIAAALV
 AKGASVGSMLTFTVAGPGTNVATLSVILRFLGGRIVAAYLVGITLCAVAAGYAADTIG
 VPVVSTGIFEASCHPSLGAVSAAILLLLMTAGIiWRLVRDRT
- 30 <SEQ ID No.:1408;PRT;Methanopyrus kandleri>
 MRPKQVWVSVAFEGEWNEKKPYVTEsIEAGVDVIVCLPEDVERVKELGNVKVAVPL
 MPESPGSPDLALEELDAIDADVVIVKGGEgdGSIDLpDDISESIDAALIEKARDRGF
 EVAEYVEILDKPYERFAAEIAKNVGPDYVIAIGRDWKIIPLENLIAELQGEKTQLIAGAR
 DAEeARIAFETLEVGSdGVLLDAERIDPSEIKKTAeIAERAAAERFELVAVEVKEVKPI
 35 GKGDRCVDTCSLMSEGEgMLVGSTSRGMFLIHSEsLENPYVEPRPFRVNAGPVH
 AYIRVPGGKTKYLAELRPGDEVLIvDTEGRTRAAVVGRlKIERRPLMLIRAEYEGVEI
 QTIVQNAETiHLVREDGEPVSvVDLKPgDKVLAYVETEEGKGRHFGMEVEETIVEK
- 40 <SEQ ID No.:1409;PRT;Methanopyrus kandleri>
 LVHIGKQIRMERIMNRETGRTLIVPMDHGVTLGpITGLEdLEETVDAVARGGANAVLL
 HKGMVRAGHRGYGRDVGLIIHLSASTELGPDPNNKVLVSRVEEAIRLGADAVSVHV
 NVGAEDePQMLKKLGEIAARCSdWGmPLVAMMYPRGPKVEDEFDVEYVKHAARV
 GAELGADIVKtNYTGDPDSFREvVKGCPVPVVIAGGPKAETPKEVLEMVKGAIEAG
 45 AAGAAIGRNIFAHKSPRMREAMTRAIRIIHEDAEVEEAMKELERV
- <SEQ ID No.:1410;PRT;Methanopyrus kandleri>
 VLRSLREALETLRHVQVLEVVAEHQPIGIGRISDVTGMewHKVRYSLRVLEEGGIIR
 PSKKGAVLTEDAPARISKISRRLSELNREFEDISKRYQSLARKLEEG
- 50 <SEQ ID No.:1411;PRT;Methanopyrus kandleri>
 MLFLSEDHVRALLDVREVVERVEETFRIKPECEMPPKTIVPLEGGDFRVMPAYLSEL
 GVAGVKIVNSHPDNPDRGLPTVMaVMCLIEPETGRPLCLVSATEITSLRTGAAGAVA

SKYLAEDVRTVGIVGAGVQGRYQLLTHAEVFDLEAVFVYDQAREAARRLAEWVER
DLGVDALVDNLDFSGLDVDVCTCTPATEPYLGSEDVPEDVHVNAIGADAPEKQE
VKTELLKRAVVVDDREQCVESGDVSPVERGELNPEELIELSDVVRGETEVDSSSE
LTVFDSTGIAILDVAVGALAYERAKKTDAGVEVKPFELPTGNFK

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<SEQ ID No.:1412;PRT;Methanopyrus kandleri>

VRGGLREFLYDIDQRRWLRVRDHVVVCGFGRVGAQAAGRLRAHGFDVWVVDTS
KERVERARREGSVFPTVEGNLTDRRTLERAGVDRARFVVVCTDSDETNVYVTLVLR
KLNP DARVIAVARDPENADLLPHAGADEVVDAYRVAGEEAVERVLAHSFTVTVRH
10 DLDEVEKEWRTIXVENG GTILDVRFHVPESPEEPIVKELPVESPEDLQRRKELLGTS
EEFRSMAEALHELCRGAHSHRVFVADPSDKERIVKELEKLGFLIGVDLSHEEVLDR
FRN

15 <SEQ ID No.:1413;PRT;Methanopyrus kandleri>
LDPVFHVAASYALARAAGYPVRTSLMYAFGINVAIDLHLLRYRWILHSPVALLAGVA
TAYAAGLRTGLVLALYTFHLLCDALAGMKGAGTGVPAMFPFSLKSYGLEAYVLLGP
KGISWSLAPIARSSEAGPAGFLVSGVGLATTLGVVIFELLGVFKKRRELALAPPV

20 <SEQ ID No.:1414;PRT;Methanopyrus kandleri>
LSAIMFVG TASNSGKSFLAAVTCAYLRQRGVDVAPFKSQNMSLNSCVAKENGEIAV
AQAFQAAMAGQEPSIHNPVLLKPKGELRSEVIVHGKPIGTMSYREYREIVFEDPW
QAVLESAEILSEEHEVIVAEGAGSPA EINVLDTDIANLRVAEALGADVILVADISRGGA
FAAVYGTIELLPERWRRLIKGFLFNKFLGDESLLP GIKELERRLGVRVYLGTVRHVGD
FWMPWEDSEALDTHSPGRG SVRIAVIRLPRISNFTDFEPLAMEPDVRVEFVDPRDN
25 LPEDADAVILPGTRTTISDLEELRKRGMDEEVQAADEGTVVLGVC GGYQMLGREL
VDESGGELDPGESVPGLGLLDAVTVFSPDAGKVTVRSEGVVNHPHLRGIRVEGFEI
HEGRTYTDEPHLVRLRSGYGNRGCFLDGAYRTDRPVLGTYLHGIFNRRFRHEFLR
WVSGGRWKPPERD VVREAVKRN LQVALEIVESTDLPELLGE

30 <SEQ ID No.:1415;PRT;Methanopyrus kandleri>
VDLDRLKVSSFERVTRPIEPKDSGLITERLGLLP GHRVFESGVGSGFLTASMARIVY
PEGEVVGIEIDTRKLEKARENLEQLGKVYEKSVTLKHGDAREYLEGLEDEFDAMVLD
LPEPDRVLEVGLDALKSNGKVAVFCPF EQVRAVWQVLED RCTWLEAVELIERKLQ
VEKRGIRPGRTL GHTGFIVFGRV

35

<SEQ ID No.:1416;PRT;Methanopyrus kandleri>

LKRIAVYGKGGIGKSTIAANVAAALAE EGYRVMVLVGCDPKADSTLTLAGRRIPTVMH
EYRRKGEG LKLEDIIVEGDFGVLCVESGGPKPGVGCAGRGVLKALEMLTRMGAFE
DVDVIFDVLGDVVC GGFALPIRRGYADTVFVVTSSSEPMSLYAANNICRGIAEYADR
40 GGAKLGGVIHNRRSRDSDSRVVTEFCRRIRAE LIYDLFYMEEV RKAESRYRTVIREF
PDSDAAEAFRELAHRMLET EGVPQPLEEEEEVLRLAGVRF

45 <SEQ ID No.:1417;PRT;Methanopyrus kandleri>
VRFVRKEITVVVVI AVIVLPAAGYYEVNYGRG SVERPVV TYGETTWRTTELPTAVELF
KEVGVDPTRFHRTIVTAEETNRVAAEVTGRRYTPSQIYSCATVTPYDEPPRRYQEV
EGYRIYVGPEITVCKPETYAEALASIGAPPCCVTIRSPVRATGEAALAGVYKAMREA
GVEITDRDARFSQAVLEAVKGAGDDPRRRAAAVTVVVVCVFRGADDPQKARDVQD
EVENVYGVNLPPETAVHAAQA AAKLAEEGA EYSWWWL FKRLLAYWI

50 <SEQ ID No.:1418;PRT;Methanopyrus kandleri>
MAKYEPVIPLEVNPEGEVSKIAEFLRGKFEEAGREIAVVGLSGGVDSSTTLGLAVE
ALGRENVALILPERDTPEEDVEDAVEAERFGVEYHVHDITEVLRAFGTGSYPCH

PFSRKSDANLKPRVRMCVLYYFANELDGLVLGTGNRTEWLTGYFTLHGDGACDVA
PIRHLYKTQVYVIAEHLGVPERIVEEKEPSARLWPGQTDEGELGIDYPTLDALLYALV
DEGLGPRKAVDWLGERGVEATEEDAELVLDLVRSSSFKRRPAPGLDLPEPEDPAM
SG

5 <SEQ ID No.:1419;PRT;Methanopyrus kandleri>
MEKVVLEFGCEFGARLWVIQQVICILVSSLVIPILAHHTVRAVRRHDLDALASFGML
LLILAAGVITPLNTLLHLYSPRIKWGILWTYIGSLGAGMVTFGMGFMFKVLTTRPAAP
FGGERS

10 <SEQ ID No.:1420;PRT;Methanopyrus kandleri>
LIGALLASHSYPTAVTWDILAEIAEILPSSITISCTDPDIWEFCIELRDHVEFLDVEEVDS
LDPTTVVALAEAAHMGPKVLRTRVRGVVIVTDDPERAAEDWRLPAVSAREIYVPV
VRVGGNATVHVYRHGEVLWRLGLREGKTLPPDYKSLRELLWNEFPYVRTIGSLAQ
15 RTNWHEVLVRLALIEEWIKGNKLVSEFLDWIPKSTKVIPRSTDSPDSSSGENLLEG
RLILIPAFSSTLSALA

<SEQ ID No.:1421;PRT;Methanopyrus kandleri>
20 LFKSRRLPSFLIEGKVDEELEDFTDDFGQPDLDIVRACVDRLDPHPDLEERVLTAKA
RKACERIGFPMGEHAEFDLYPWLAPQIFHERVVRDVYSGESREPGEARVAFVSVH
HDKRGVAEYVYRTLERLEPEAVCLETSPAGLETAHYTLSPHAGIEVMARVPTK
MLMGPFRLDYALVYCLREGVPAIPVDVPSSLKLKESRKNPECLRDPIVFEYTSEVE
RVLGPTGELFFREYEEVEPVLRLGGEIRTNVSLVASETFVRFHLEFRERYMLSRIA
DVTEDFDRVAVVVGAVHTSAMERAWREGEFRYLEPSPEDFKGVEWELSPRYKRH
25 KLVVGGRRR

<SEQ ID No.:1422;PRT;Methanopyrus kandleri>
VIGVVVLGATGRMGRRICRMVIEDEEELVGAIASPTSKHLGRDVGLVIGVGETGVEI
APPTALPNIAKDADVAIDFTVREATLENAPKAARAGLDLVIGTTGFSDEDLRVLEHEIE
30 EAGVSAVISPNMSLGVNLLFELTRQLARVLGDNGFDVEIHHHRHKVDAPSGTALE
LAAIIIEELGKGEKVFGREGNVGPRDDDEIGVLAVRGGEVVG DHTVMALGEYERIEL
THRALS RDAFAK GALVAAKFVVEAPPGIYSMRDVLFGGKRGEGL

<SEQ ID No.:1423;PRT;Methanopyrus kandleri>
35 MRRVLVLSIALMALAAPGLAEDKAVTATTEQQSQQAQTAEQQTEQQATAPAPKTV
TLKLTPSLQADFTVDLKNGEAVLTLTGGYSLVTEGQDLLSDVLTAALAGAINIVAPID
GKELLPGVKLEAGVEAPTVTAGLGEDCGVTLTATVLKVEVPKLEDEHEWSETVTE
DPLKSGISVALRLLHTAEFPFIKATLDLLTGALKVVVHLFELEVGSPESEDYEGPYLELT
PVNVSEKLNDNATVTAYLGASLSASTLKLSPITITYETTTPLKLPVTLPEITLYTFQLPA
40

<SEQ ID No.:1424;PRT;Methanopyrus kandleri>
VPGEAPVEDYDPKEIEPKWRERWLEERKYRFEGGEDRPAFVIDTPPPYPTGELHM
GHVLNWTYMDVVARYKRMCGYDVFFPQGWDCGLPTEVKVEEIHGITKRDAPRR
EFRKLCEELTLENIRKMREQLIQLGCSIDWWTDCIDYENEELKELGSYVTMDPDYIR
45 RSQYGFFELLEKGYAYREEHPVNWCPRCETAIAFAEVEYVTRETYLNYIEFPVADG
DGSVTIATTRPELLPACVAVAVHPDDDRYSDLVGKKLVPLHERFGDRDTPWEVPV
IADEEVDPEFGTGIVMICTFGDKQDVAWVKRHDLPVIRAIDEQGKMTVEVAGEFAGM
EVEEAAAIVEALKEEGYLVKREKITQNVGVCWRCKTPIELVKEQWFKVRELAE
VKEAARKMWIPEHMRKRLEDWTESMDWDWCISRQRIFATPIPVWYCKEAGEVIP
50 AEKDQLPVDPTRDDPPVDECPKCGCSEFEPETDVMMDTWMDSSITPLVITGWPDEE
PDLVPDLRPQGHDIIRTWLYTTVRALVHADTEPFKEILINGMVFGEDGYKMSKSRG
NVVEPTEVIEEYGADALRYWAVSSGAPGSDVQYMTKTIKRGYRFAKKIWNVCRLAK

- 5 DHIDDAPSVEEVEGDLTPADRWILSKFHRLVDEVTEHLESGYRFNDAIKAIEEFAWE
ELADDYLEMAKLRLYRPEELGEGSREAAVAVLRHVLDGLLRLLAPFMPFVTEELY
RLFDESVDQAWPEASEKWIDEGVEEVGEILREIVTEVRKAKTDAGLRMGAEFEG
TVHVQDEELAESLEKAIPDLKSATRAKEVEVEVGEPKLERVPVKVEPRMDVIGPKYR
ELTRDIEYVENNPDEVASAIKEDGKAKLEIDGKVVLDDEECVDVEWELRVKGGEGK
AVEIRPGVVEIRGLST
- 10 <SEQ ID No.:1425;PRT;Methanopyrus kandleri>
VTVLNSHVHSPTSRTFLLFLAAWLLLSFLMMFLYFVSIPGFFHALGLEPRTALLSLL
SIVGSANVPPIKRIRKLVTVQHETYGFWGISYQVPVRRSEEIVAVNVGGCLIPVAVSV
YLIATNLDLWLQYLLATAVTTIVSYATARVIPGVGIAVPFFLPAAVAGTVALLTTKGA
ASVAYVAGTLGTLIGADLLNLRKAVNWGSAPVLSIGGAGTFDAVFVTGLTAVWIAVY
LSPGAGT
- 15 <SEQ ID No.:1426;PRT;Methanopyrus kandleri>
VDRVRPLAGGRNVRIEAVLNIDPYVPGKSKEEIAREYGIEPDEIVKLGSNENPLGPS
PKAVKAAKRELERLHEYPEPLAPPSLYEAIIDYLADPPYPAGEPVEITREHLVVG DG
ADEIIDVLTRVLVDPGDPVPIPVPTFSQYGISARACGAEVRKPRFDPERGFELDEDSL
FEALDREVRLVYLCTPNNTGNRIRERVVRDVVEECRGVVLIDHAYVEFADHDYTPL
20 ALEYDNVLVLR TCSKALGLAGARVGYGIANPELIEHLHRIKPVFSLTRPSAAAAEATF
RDRDYIEKSVRLMIESRKLYRELRLKDLRTPFPSEANYLLVDVSN TGMNASEFTEE
LLKRGVVRDCSSFEGIEPFYVRVSTGTLEEDRK FIEVVKDVLEV
- 25 <SEQ ID No.:1427;PRT;Methanopyrus kandleri>
VTRLSLPTSRHCEGCPGAEGEGPHHPTLELTSCPYKCPHCYARYAENVGVVVKP
GLYGEPQGCLTVSQYGEPTVLGRELIDVLEMVRETGLFDRIDLQTRGYRPDLAPKL
SEICDLVMVSIDVTDPDVHRR LHGVGPERTLRFVNTDRPVIRSLYLPGINDDL PQG
LADTEIEPAEVFVQPLIPFGKAVENLKRIGLRDHYNVVGSLLNWAEKFEEFGF DVRF
PACWVDSLRLKERMEEELGFVDLRNVRYSPDPGTPAPER RFTPLRELLDELVR
- 30 <SEQ ID No.:1428;PRT;Methanopyrus kandleri>
VQVVGVGPNPTRFLTIEAIERIARADLLISSESILREIDGLRVEAEIDLSDKEVVTWNG
SVRETLTEYADSDPVVARGDPTYMGVGR LASLLFDDVEIVPGVSSLQALTARFGR
GFHEVEAHVNLHSEEDVEKVVESLGAGRTTAVLFGKVRPAKV VETIESVGLNVK VIA
35 GERLWYPDERLATELHSLRNFSEFTVAIFEPDHVIETSLR
- 40 <SEQ ID No.:1429;PRT;Methanopyrus kandleri>
VRGEETLAEVVL TMDRTLASN YRGGMFMGFSACVPKGIIPDWLYFSVFCPSVEYDE
ETGEVKEAPLGIRRIEAQLRREGYDVAVVHPDAVHKAIDEDTIAVGVSEIDPQGMGP
ATTTFTSFSGKPAYMKVCFEDLMERIRELKDRYGFVFMGGPGAWQVAETFP RFG
VDFLIMGEGEYVVG EVVRRIEEDRGLEIVRGKPVA AEIDIPTIVNPTTNGIVEVARGC
GRGCKFCSPDMRELRSFPLSKILEDVDVNVRRGGHEEILLHAEDVLRYKADGWRPNV
EAVLELFSAVMNRPGVKRVS VSHVALSTVCQFDERLGEISEVAGVGELVPWMGAQ
VGVETGSPRLMAEHMPGKVAPYKVEEWPDVVEQAFGIMNDHGWVPCGTLILGLPG
45 ETEDDVMMTVELLDRLRDYKSFIVPLFFVPIGESRLSDH DFFTPEKLTEVHWEVILKC
VDHDLKWLP ELYEEYARANGHGPLVKLTIRALTWYGRRKIFKSALKWCPEKELVEA
VLG
- 50 <SEQ ID No.:1430;PRT;Methanopyrus kandleri>
MECRVKVFLCADGRPVMGPGRYALLKAISEEGTVKGAAERLGWSYGYARRSIEAL
ERAFGRKVQTERGGPEGGRASLTDFGRKLVEEYERAMKEVREKGLKPIL

- <SEQ ID No.:1431;PRT;Methanopyrus kandleri>
LNAKIVHISDLHISPYRKSWSPFVYRGIEQINDLRPDVVITGDLTDNGLVREYEEV
SSLLEKIEAPVVPVPGNHDA RN LGWMTFEDVFGDRYRVERVSADLYVVG L D S S E P
5 DVDY G Q L G R E R Q E W L E E T L R R I P G G A C K C I A M H H H L L P V P G A G R E R N V L V D A G E M
INLCIKYGV DLVLCGHRHVPFAAKVEDTVV N A G T F S A T K L R G Y S R N S F N V I E F S E S
TVSVNLYEITTEKLELARYKPVVREGEYRLVRVKG I A D I L R E S A
- <SEQ ID No.:1432;PRT;Methanopyrus kandleri>
MNVVKEGWPDAPSHVCRGGPPEALAFCCPPVKPCPIFHALDEAGLDPEEYVRRKK
10 EFAEKTPLGSGKNTCFGSLVWCCKITKPCPLRDSTLQRIGMSPEEYMWKKKLAE
YLLGKKDLDEILRETSESEPEEETVEVVAEAAGVSEEEARRALEEANGDPVRAVKLL
KSRGKGD
- <SEQ ID No.:1433;PRT;Methanopyrus kandleri>
15 VSWVIRVEDLVKEFEDFRLEIPELEIGEGLGVLGESGAGKSVFIHVLKGLDDYEPD
EGRILYRVGMCPECGWIERPEFIDGEQCPKCEKGKLEEEVVDLWGLSDTERRRFRK
RIAIMFQRTFALYEEQTVLENVMEALEEAGYSGEEAVQRAVDLIEMVQLEHRITHLA
RDLSGGEKQRVVLIRQLAKKPIVFLADEPTGTLDPETADIVHKALREGVKEEGITMVI
TSHWPEVIEDISDKAVWLEDGCVKEVGEPSEVVSKYLELVEEVEREEVVGDDIIRV
20 KDVKKYYSIERGVVKAVDGVSLDVKEAEVYGIVGKSGAGKTTLAKILAGVLEPTG
EVYVRVGDDWVDMTDRRERGRAKRYIGMLHQYTLYPHRTVLENLTKAIGIELPDE
LARMKAVHVLKVVGFDKAVNILDKYPDQLSEGERHRVALAQVLIREPRILILDEPT
GTMDPITMRKVAKSILNARKEMNQTFVIVSHDMDFVLMVCDRASLMRDGKFVKTGD
PEEIVRELTPEEREEMIRQE
25
- <SEQ ID No.:1434;PRT;Methanopyrus kandleri>
LKPIRVCECGKYTEKHTCERCGRRTTEFLDGRRLALS K L L S G I L R H F P E E V K V K L
DDEGFTDCDVHELAERIKKYWKNREYYRWLTGEHIIAVVETCPKGRFEIDEHGRIRA
RYGHSRRLSVRPTLPEAENVKELYHGTARENLESILQHGIKPMGRRAVHLTDDERE
30 ALITALRHTRNPVILVDAERLRRHGLVPRKAGKNVYVVEGTVPPDCITRVIRNPRRS
VESEKR
- <SEQ ID No.:1435;PRT;Methanopyrus kandleri>
VKSAEWFEASTEEERVEIQRKVARKVRLEPLDDVDAVAGVDVSYRGEEYRAAAVVL
35 DPETYEVLDRRVVHGTTDVPYEPGFLAFREGPPALEALEGLDFDLLFVHGHGVAHP
RRAGLASHLGVALDVPTIGVARRPLVGRSKEEPSRIGDTPLVHRGEVVGYLVRTD
AEARPVVSPGHRCNLEDAVRWTLRLVRVGKWPEPLRLADLLSRRGASRVEGESR
GAGVRR
- <SEQ ID No.:1436;PRT;Methanopyrus kandleri>
40 VALVYDAEFVGSEREFEEERETFLKGVKAYDGVLATRYLMERSSSAKNDEELLEHL
QNFILLTGSYACSIDPTEDRYQNVIVRGVNFDERVQRLSTGGSPARYAIVYRRGWR
AIAKALDIDEEDVPAIEVRAVKRNPLQPALYRILVRYGRVDLMPVTVDVPPEMAGEF
ERLIERYDVPIDEKEERILEILRENPWTPHDEIARRLGLSVSEVEGEKDPESGGIYSL
45 WSRVVVNIEYDERTAKRHVKRRDRLLEELYEHLEELSERYLRHPLTRRWIVEHKRDI
MRRYLEQRIVECALKLQDRYGIREDVALCLARAFDGSISMIATTPYRTLKDVCPTLTL
EEAKSVNRTLATLIDEHGLSPDAADELIEHFESIAGILATDLEEIERMYEEGR L S E E A Y
RAAVEIQLAELTKKEGVGRKTAERLLRAFGNPERVKQLAREFEIEKLASVEGVGERV
LRSLVPGYASLISIRGIDRERAERLLKKYGGYSK V R E A G V E E L R E D G L T D A Q I R E L K G
50 LKTLESIVGDLEKADELKRKYGSASAVRRLPVEELRELGFSDDEIAEIKGIPKKLREAF
DLETAALYERYGSLKEIGRRLSYDDLLELGATPKAAAEIKGPEFKFLLNIEGVGPKL
AERILEAVDYDLERLASLNPEELA E K V E G L G E E L A E R V V Y A A R E R V E S R R K S G R Q E

WO 03/076575

- RSEEEWKELERKVGEGRRRLIEYFGSAGEVGKLVENAEVSKLLEVPGIGDEAVA
 RLVPGYKTLRDAGLTPAEAERVLKRYGSVSKVQEGATPDELRELGLGDAKIARILGL
 RSLVNKRLDVDYTAYELKRRYGSVSAVRKAPVKELRELGLSDRKIARIKIPETMLQV
 RGMSVEKAERLLERFDTWTKVKEAPVSELVRVPGVGLSLVKEIKAQVDPAWKALLD
 5 VKGVSPELADRLVEELGSPYRVLTAKKSDLMRVERVGPKLAERIRAAGKRYVEERR
 SRRERIRRLRG
- <SEQ ID No.:1437;PRT;Methanopyrus kandleri>
 LGLDEIVNGFPLKEEWVYLDNAATSLKHHERVISAMERVLREFGVNVGRGAHPPGEC
 10 ATEEFERARDIVASFLGVEPECLAFTLNTTHSIHYVLASIRWKKGDVVTTALEHHSN
 LAPWLRFSVLGFEVEVVGFDRETGEVDMAELESVDDNTRLIAITHESNALGSLQP
 VDEILELAEVGAAYLLDAAQSLGHMDHDSRYHFLAAPGHKGLLGPHGTGILYVR
 EDVMEELRLLLGGGSTDYVTRDLEVVPREPPLSFESGTPNLPGVIGLAEGVKILEE
 VGLNRVERRIRKVTRRILNGLEELEGVEILAPEAERKTIVPFLVDGVDYAIEVGKKLGE
 15 RNICVRTGRHCASLVFERLGLDGCVRASVAFYNDIEEAERFLEVVEEIRGS
- <SEQ ID No.:1438;PRT;Methanopyrus kandleri>
 MGGSESVVPVLLPFLEDPLTMFSPSRVIIPSTRYIMEVVRDLRAPWRGEVLDAGAGC
 GSFALTVAALGPYTVYAVEPDPEHSAALSANVSANRDVLLGDVLPLECSIEDFRRPV
 20 DEVLTDPPWGLRSGISRTPDLEFVLSFLDACVDVLRPKTGRLVTRCPPEFIDDIVDH
 MSERGYLLDRVKRRHKAAYLVLRSEDHRDYDDRESAVAAAGGQVLVAWEGGEL
 DPEADRYSLVTPYESGWHVWEVPNTGRIREFLRGFLKGG
- <SEQ ID No.:1439;PRT;Methanopyrus kandleri>
 25 VSELFERGHWSYWCVPVWYCGFPFLLYPPLFYLVGGALNLPLGDPVQTLRILGLTA
 VYLLVVGIFACRQLGFTTFEAALSTLLFLTSPSILWEINRGGIFPMMMSLGFGLLALG
 LLERTLSRGFTPKSALGVIALITLSLFTHPIGGMTCCGALILRVLLLEVPEGSLRPNQ
 WFRALTDQRNLPPLLPAALPLLLAAPQYLPMLLYRGYISPLVTPAPQTPLDCIVTLLS
 CPMWSPLPFFILLSVLGAYYALRRSGPGIRLYGALTCLIFCASVFSLLAFWSIYKVAP
 30 GGQLITHRLPGVLFPLFGALILGCVIRHRPKVFATLAIPQLLLFAVYVWSYTQPVLDL
 SVREGHIPSPVVHLWKAMDLLPRCVGAGLTSPQSLLWTLVAAGGFFTLDTKPTEDA
 KCALHYLRHQGGPYDRVTFDPFTHVPLYRCDSAFVPIESGHYSLLGWFNQGDPAF
 YSLAWYVEWQHSWVFYPNAVLTVFHLANVRYVISGSPKWTASLERLPEFHRLTDF
 GRYTVFSTSVSPGPAELVPRPILVIDDILRRPNPYTMMVNIIPDGGTRRIFVEGSPED
 35 VARFRQIIVRTDRPDTLDEVLRKMKSGRVLVIVPANDYATARYLAERFGLHVRPVIVC
 PWEPLPSMKVCNRLIDAYRFVGITVPGATPEERTWFLFNGRPWVDVKLGKVEVRV
 CGVDFVDLAGTLHQTLYYGAGAYPLPPKWERALLNEVLRGFDGKPRPVKFKAVE
 PDDVRVRGKGYILVKIGYHPAWHANAPTYRGSGLIIVRSTGVTRLRFGFTWWERM
 LWWGAFAIGLMGSTWLYLRGRDEGR
 40
- <SEQ ID No.:1440;PRT;Methanopyrus kandleri>
 VGKTMAEKILSRASGEDAEAGDIVVANIDVAMVHDITGPITVQRLEEMGVERVWDPS
 KIVVLFQVHQPADSVEAAENHKIMREFVEEQGIEHFYDVREGVCHQVLPEKGHVRP
 GDVIVGADSHCTHGA LGAFATGIGSTDMAAVFATGKLWFRVPETYRVEITGELPE
 45 GVIYAKDVVLKVTGEIGADGATYMAIEYHGEVREMSVSDRMCLCNMAIEMGAKTG
 MVPPDEKTLEYVKKRAGTEGRPVEPDPAARYEAELTLDVSDLEPQVAKPFSPDNV
 PVGEVEGIAIDQVFIGSCTNGRYEDLKVAEEVLEGEVHDDVRLVIVIPASREVYHRTL
 KDGVLVLHEAGALICPPNCGPCLGGHMGVLAEGERCVATSNRNFPGRMGHRES
 EVYLASPATAAASAIEGEITDPRPYL
 50
- <SEQ ID No.:1441;PRT;Methanopyrus kandleri>

- VPRSRGAILTSDIDRLVEKLAEVVGKREEEVRREINRLRKRWGVSELGALLALADRM
GVKLMRTGEEKPGRVTLDEAISRLQSFDFEIVVRVSDPAKTRSGGKMVTLVVGD
ETRSAALVAFDEAVETLEELEEGDVVRARNLTVSSFRNSPQLVVTRETELEVVGSE
EDPNRIIERNISEVKHGEYVRVRGVVASEPVDTERVYFWLSDETGSTRVNLWGEE
5 AERALDL DYGDGVIVEGWVSTRGDHPTINILRTQGRVEPAEVSIPAIRKRVEELGK
GDVAEVS GVVAVYARRRYEACPTCGRAMRKGECEPHGAVEPERRPVLNVVDD
GTGTVRTVFFGEHAVEFAGYETTREYLEADESDIEKRLLGESVSVLVRVRGEGVVE
DYDAVALRARILNEEDFKREIPILVRELKGESEEGEEAE
- 10 <SEQ ID No.:1442;PRT;Methanopyrus kandleri>
VKERKLSDDLDPDET VKKLEEKGI VTVEDFIYADPKYLSEVTGMSERDVEDIQEELR
NIDVEFETLEKLERKRRRITTGSSALDEILGGGVPCGELTEFAGPFGSGKSQIVFQLC
VNVQLPEEEGGLESKAIFIDTEGTVSPGRIKGM AEALGLDPGEALRN VFVTQVRSVE
EQMRAAEEAHKLCEREDIGLVVIDSLTAHFRAEYSKLGDVSERQARLMKHVDQLRN
15 LAMDHDVAVVFTNQVHVDIEAATKGKGRRYEPVGGTIVAHQATHRIMLRRAKGEVR
IARIIDSPYLPQREAAFRITEEGIRDVEFPER
- <SEQ ID No.:1443;PRT;Methanopyrus kandleri>
MEFDVVVVGAGPAGSVAAWAAAEAGCDVLILERKAEIGVPKQCAEGISARALEEVGI
20 RPDDGWIAAEIERGILSLPSGSKFEVEVEGYVLERRVFDKWLVRRAVEAGAEVELLA
HARRALLDEGRVVGVEYEGEDGVHEVRARIVIAADGIESRIGRTAGLVPQLEPDHIC
TCAQYEVVGDYDPKAFMIHFDPERIPGGYAWVFPKGENRANVGVGIRGSESSPG
LALKTLDELVEGPLSELVAGTPVEVNVGGVPVCGPVERTYGDGILLVGDAARQVNP
LTGGGLNTALICGRIAGEVAVEAIEEDDT SASFLKRYQDRWEEEFRTDFECAREVAE
25 MLPELDLKEVVEFLSSVENLEEMLR TSGILEDVWWG
- <SEQ ID No.:1444;PRT;Methanopyrus kandleri>
MPDVRRCDFCGRRIEPTGKMFVKNDGTILWFCSSKERNMLKLGRDPKKVRWTE
KHFREFMAEQRGEL
30
- <SEQ ID No.:1445;PRT;Methanopyrus kandleri>
MVECDYDPTEDATPAEVVEILGRTGMAGEVTQVKVRILEGPDKGRIITRN VKGPVRE
GDILLRETEREARPIE
- 35 <SEQ ID No.:1446;PRT;Methanopyrus kandleri>
LPEFKVVADPEKARSYQVEVKGEDAEKLGKRIGDVIDGEIVGLPGYKLKITGGTDK
DGFPMRPDIHGPRVRLLLSGPPGFRPERKGERRRKTVRGNTISEDIVQVNTVIVEY
GDKPVEELLGEGGEE
- 40 <SEQ ID No.:1447;PRT;Methanopyrus kandleri>
VDDERFQQAEMNIGMVGHVDHGKTTLT KALSGVWTDTHSEETRRGISIRLGYADTV
LTRCPEC DTYSVEEKCEPCGAETEWLRRVSFVDS PGHETLMATMLSGAAIMDAAIL
VIAANEP C PQPTREHLMALEIIGTEDVIVVQNKIDLVTP EEAREHYEQIVQFLEEETH
LDPDKTPIIPVSAQH KANLDVLVEAMYEHFEPPEYDL DAPFRMYIARSFDVNKPGTR
45 PSDLKGGVIGGAIVQGEVEIGDEIEIRPGIRVERYGRTEWEPVYTEVVS LHANVTPVE
RARPGGLVGIGTKLDPTMTKADRLSGQVAGEPDTLPPVRHELLLEVELLERVVGTE
EERKVEPIRTNEVLMLTVGTATTVGVT SARDDEIEIKLQPVCAEEGDRVAISRRIQ
RWRLIGHGVIKG
- 50 <SEQ ID No.:1448;PRT;Methanopyrus kandleri>

VTIRVVLNANFLMIPHQEGVDVFSELDRLLGSRPIVPRQVLEELERVKRAATGRDKI
AARVALSLVDAKGIEVVDVKGRDGDEAILNLARRWDRVYVGTDRDKELKKRLWKLG
PVITLRQRTHLVIERG

5 <SEQ ID No.:1449;PRT;Methanopyrus kandleri>
LEVPPSPVLSDALGKRYVLRGIRHIVGPVPICGRAVTVLVEGTDWGTVEAIDEAEE
GDVLVIQARDRARAYWGGGLSSLSAKRKGLAGTVVDGLVRDVEDDREIGYTVFARG
VTPRAGTHRRSGKINVDLYVSGVLVRPGDIIVGDESGVWVPEEEWEDALKRAREIL
ELEDDIRTDIAANRAWWEIVPDKLGGW

10 <SEQ ID No.:1450;PRT;Methanopyrus kandleri>
MMNLWKDLEPGPNPPDVYAVIEIPRGSRNKYEYDEERGFFKLDRVLYSPFHYPLD
YGFIPRTLYDDGDPLDILVIMQDPTFPGCVIEARPIGLMKMLDDSDQDDKVLAVPTED
PRFKDVKDLDDVPKHLLEIAHMFSEYKRLEGKETEVLGWEGADAAKEAIVHAIELY
15 EEEHG

<SEQ ID No.:1451;PRT;Methanopyrus kandleri>
LYELVELETTVRIPPTQFTSDVEDAVLKALENDVEGKLFREDDTGEPIGFVVFVDEIL
DVENEGIFPGDGASYHRVFRALVFRPVEREVVGEVTRVKEYGAFVRLGPLDGLL
20 HVSQILDEYMYDGAREALVGEETGRELKRGDVIKVMIIIGVSLNEERPRDSKIALTVK
RPGLGKPEWWE

<SEQ ID No.:1452;PRT;Methanopyrus kandleri>
LSKLKACVRCGYLVEEDTEICPACHGDEFTENWRGIAVILDTESQTADRLNAKIPGK
25 YALRVEE

<SEQ ID No.:1453;PRT;Methanopyrus kandleri>
VTVVLRLPRELRLRPWGTLYPRPSIKTYRRLHEESEVLITVGDMTTRSFLRCSIR
PDVAVVDRKMLRTVPVDPGNKFPVTLVDVNNPPGTITREAWDTVRRGIDYALDGDAT
30 LIDVTGEEDLLAIPAILIAPENSIVCYGLPGEGMVAARVTQHLKDSVLRLLTRFRGYDE
WKSRSWISGITPCCTAKR

<SEQ ID No.:1454;PRT;Methanopyrus kandleri>
MEVEILDQRDNPLLYRKEVKFVVRHEDSGTPQKSEVLRKLAAILDVDKEVVLIDRME
35 SEFGKRETKGYAKIYKSMEHLEDIEPEHMVERHKKVLEELESESESESESESESE
EE

<SEQ ID No.:1455;PRT;Methanopyrus kandleri>
MGVPRRAKLYEVKDGKVERKNPFCPRCGPGVFMADHGNRYACGRGCTEFKDKQ
40 PEPKKKK

<SEQ ID No.:1456;PRT;Methanopyrus kandleri>
VEAGDVIALGAESLLVRHDWLGLLAVYKIRLPKPYRHPSLDERLRLRLTRREARALIR
LPEMGVPTPTLYEVDLDLSLLITEYIPGRTLKQATESSFDPDHYRKLGLVGRMHEH
45 GFVHYDLTTSNVLVSGDDLYIIDLGLSEDSDDPEDHAVDLRVFERCLESSHPEVKEEA
WRAFLRGYREEREATDTVLRALEDLKSRYI

<SEQ ID No.:1457;PRT;Methanopyrus kandleri>
MTDLNLSLFRDCRFVLEELGCVVEEVDSDYQLDFVRSDDFCFALVCVGGLSDLA
50 SISALGEWEEGLAEIARDAEALGLGALVFPREPREEVSVSAFCEHYGLGLAVTE
WETLPLEVIEDPFRLDYGSATEVFLEAKLGRIPEWPDTEPLEDLLVGDRPVTGPDVV
QVVKREVS LDWRDLVMRLRWAGYSGEGLSEALYSALMSDEVENTEDGELMHVPE

RLSEVLGALLVWLQNRGRVPEDEVYEFLFAQFGVPYDVTYVALKKLEERGEIEVKR
GLVVAKV

<SEQ ID No.:1458;PRT;Methanopyrus kandleri>

5 MICVGIESTAELGVGVVTDGGEILVNVKAQYIPPPGSGILPREAAEHHSRELPELLE
RALKNAGVEPEDIDLVAYSQGPGLGPCLRVGATAARTLALTLEVPLAPVNHCVAHV
EIGKLAARQDGFDFDEPVTLYVSGGNTQVLALKAGRYRVFGETLDLPVGNMLDTFA
RKVGLPHPGGPEIERLAEEGEPVELPYTVRGTDVSFSGLLTAALRRYEQGDRLDV
10 CAGLQETAFAMLVEITERAAAQLGRDEILLTGGVAANRRLSEMMHEMAEDRGAEAY
TVPPELAGDNGAMIAWTGILVHEHGLSIPPDEIPEKAIVKQRYRVDEAPVPWAARPS
RSADSQG

<SEQ ID No.:1459;PRT;Methanopyrus kandleri>

15 VRYKPLRFELECVEPGALPRFKGFAVRGMLLRRLKERFPGFVRRFLYGNHPIPAVT
QVPPLTDERMVDVGDIVSFRNLNFGDAVDRDYEIILALVDGELRLGSARFVLRVEH
AETGEPVWDESAYRCVKPEKLDAREPVGRYLVVFTTPTYIVHDGKPRVPKFHMIV
RNAARKFTMLHRRFGLEGLTRRQARNIIEWAERAETIRMDYRFETLERRSARLGRH
VVRTIVGTFVYELPPEPPDRVGEVLAFAEVYGVGKFN TAGLGRFVLGEAG

20 <SEQ ID No.:1460;PRT;Methanopyrus kandleri>

VELKFSAEVELTSLREVDPAEIEPTVEEFVKEANEDLLQRGVPTGKEGAKIESYRVLE
DTIEMEITGTRYLRPHEAAMRVKRRLAERLGRKHRVGVRDLKIPRYEVVLRFDREVT
RDDVGYVPVADDVVVEDGTVRLTFQDVDEEMLRRHVIDRVIRLVAAVEERSELVE
25 RVTKVEPGTVVDESGPREIRFDGDVTEEARRRGWVKEFPGRGQWIYTPPMAALFE
VLRDFFLLERVTRKLGFEPAFLPKLIPLTFMFRMYLHGLPDGMYVVCPPKRDPFLFD
DFKRELYVWGELNERTLGSLKEKLRDPGYVLAPAQCEPFYELLRDEVDPERLPIKL
YDCSGWTYRWEGGAAGLERVNEFQRIEHVWIAEPEEAERIREELLEATKRVAEEL
ELEWKVVVSDDPFYLEGRLLIEDRDIELPDVPSYEFVYLPFKGERSSEEAWISVGSF
30 NVHGEHFVDGFNVKEKSGRTLFTGCAGLGVTRWVVGLLAQHGFEPEEWPEPILERI
DEKFGGLPEVPKLTWPE

<SEQ ID No.:1461;PRT;Methanopyrus kandleri>

35 LVRDKWKDKVWYTILAPDMFDNVEVGETPADDPKVGIRVLETTGLDVLDDITKHHI
KVFFRIYDVEGTTAYSKFEGHRLMRDYVRSLVRRGTSRIDGVIDVTKDGYKVRVA
GLAFTTTRAKTSQQRAIRKEMFKVIEENAKCEDFDEFIRRCLSISEEESIPEQIKEAG
RKIYPIRQAEIRKTEVLEENGLPPYEAVGDRATPELAS

<SEQ ID No.:1462;PRT;Methanopyrus kandleri>

40 MFLVKTQRNLEDVAAAMIEEETGAEAKPRPFGYLGLVIVTGHVTKDELEKIPEVERAI
PVEAECRADPKEIAETAELAETKISEDETFAVRTIRRGEDFTSVDVNVEAGDAVR
KATGASVDLDDPDKIVWVEILRDRAVLAVLPGEEEWKKLPPGKPEADPLLAKLELAQ
IPYLGDPRAAYSMGERIGRAVQGFELKSYIVTPYEPVNAVELLHFLRGLRDGVKSRM
DVQRESYGREFRRTLELLYDLQLIRLKRDLIIGTDPKGDPTYEIRKTLGEALREAD
45 EVVVLGSRVGLPRGVLRACDFVVDLCPGVTFATEHVVPVSVTALVDSYLEAEGSE
DREG

<SEQ ID No.:1463;PRT;Methanopyrus kandleri>

50 VNRTGGSPGALPLEVGVVHLPPLPGSPRAKSIEEVVERARRDAARLEDGGVDAVL
VENFGDTPYYPDDVPKITVACMTRAVAEEVDTVSVPGVNVLRNDGVAAVDVCAAT
GASFIRVNAYVEAVATDQGVLPVAHMMWREIDRLGVDVEVYADIRVKHGRPLDDR
PVEEVARDAVERGLADAVIVTGSATGSPPRPEEVKVARVVDRLVVGSGVTPENAH
VFLRAGAAGFIVGTYFKKNGITENPVDVDRVRELVRFIRRSVERWP

- 5 <SEQ ID No.:1464;PRT;Methanopyrus kandleri>
LALIQKRLNRRELEWVRKRVAREAAARLLYEGAVDEYIDAKRLAARRLGVDVMPSNR
EVAIELDRIGDELEGEELHRLKRLREEALKVMEAIEDLEPRLIGSVWRGNIKRES DI
DIAVLGTTDPEEVIERLKEAGIEVLDVEEVVITERGGKPLDIPEHYVNIKVRTPGGEKA
EIGVTVSSPELERKGRVDLGRCDFFGDKITGLSVEELRKLLREDPYRKFI PRG
- 10 <SEQ ID No.:1465;PRT;Methanopyrus kandleri>
LRVFIGVTGASGQIYARRLIEVLHEEGVDVEISVTRSAEYVMEQEGVDLPENVRRYD
PKDLTAPPASGTYRIDAYIVCPCTLHTLSSVAVGVAGDLIKRAAVVALKEGRPLVFVV
RETPWPRSALQAALKLREEGAVILPACPAFYHGPPTIEDLV DYVQKVLDTIGVEVD
LVRYQPRGMNFR
- 15 <SEQ ID No.:1466;PRT;Methanopyrus kandleri>
LILTPVIAVTGVLLGLLYAPISVVIAFLVETVLTSGLSGPYRLVIAAVVVAPIVEELSKGL
GFLVVRVLAGALRLASRFPVIGPTVGTAAKVVRECGRRPVGTVTVAATTALGFGS
MENVFYALVGLKFGLLGPIIVGVFVRTFTSLPIHVIATSSFGLLYGSLRRRWLGFAVG
STAISIHA AFNFAAVYARYKATHGLIGT
- 20 <SEQ ID No.:1467;PRT;Methanopyrus kandleri>
VVFVAKYLG SARYSELDEELKDFARLKAHLAGVDLNRDPELMIFNVEGTSSYYIVFLE
EVESEEDVERLLREDMGAELSRDSKASVRRVLNR
- 25 <SEQ ID No.:1468;PRT;Methanopyrus kandleri>
LKAQWVALNEVVSEL RARGE EVPGEVLENLRTARVILHHYEFDPHTSARTLGKAHK
YLDRAQRALARICESHPDLLDKLVEWPKR VKELAA RFREDTARSKFEPMPNRPVPR
AGDGFARVRLPEPIEVERLQDVCEFAGVIVEMKEVDVVEVFGDRDRVGTALKE LRE
LPESWKKMLEKRKSNE
- 30 <SEQ ID No.:1469;PRT;Methanopyrus kandleri>
VIGIATADFHGDVEKAEQVAEKA ADEDADVIFVAGDVSDFNLEDPAQVAEEIVDVLK
EHGQEIMAVPGNCDTPEVVRVLDTS GVSVHLKVKHIGRYDVVGMGGSNPTPFDT P
LEFEEDVIESRLRELMNSTDEPVILLTHAPPKDTAVDKVEAGDHVGSEAIRKIVEEFQ
PKLHICAHIEAAGEDELGNTRVINPGPGGTVVVEL
- 35 <SEQ ID No.:1470;PRT;Methanopyrus kandleri>
VKVNP KFPWEREVIEFVRTEMSEVSPSHDFEHVKRVVGLCEFIRRKEGGDPEILRA
AAWLHDIGRPAEERSGEDHAEVSAEIAEDLLPRVGFP SDKLGEVTHAIRAHRFSTGP
EPQTLEAKILQDADNLDALGAMGIARCFCAVGERGTSLESGVEHFHEKLLRLPELM
40 HTETARRLAEERRRRMVLFLEWLEKEWRMRS
- 45 <SEQ ID No.:1471;PRT;Methanopyrus kandleri>
VADDEVKPIVRIADVLDGHKKVPYALTGIKGIGIRMAYAICRELGLDEEKKLGELSD
EEIERIEEEEIKKLSEGESNIPSWMYNRQKDYETGEDMHLVGAELEMTVKQDIDRLKKI
RAYRGIRHELGLPVRGQRTKSSFRRGRTVG VKKKQ
- 50 <SEQ ID No.:1472;PRT;Methanopyrus kandleri>
MGDPKRPRKKYETPRHPWEAERLEYERKL MRKYGLRRKKELWRHQTQLKRWRE
RAKELMARTDPEAQREREALFRKLYDLGILDKKPEEATLDDILRLTVEDVLERRLQTI
VYRKGLAKTPLQARQLVVRHIAIGDRIVTPSYLV SREEEEEVDYSPYSPLKDEDH
PIRCEARGESPEETA AEE

WO 03/076575

<SEQ ID No.:1473;PRT;Methanopyrus kandleri>
 MAEKEGKKEKKERWGIAHIYASFNTIITITDLTGAETFARWSGGMVVDADREESSP
 YAAMKAARRAAEEAMEKGITAVHVKVRAPGGHGPKTPGPGAQAAIRALARAGLKIG
 RIEDVTPIPHDGTTRPGGKRGRRV

5

<SEQ ID No.:1474;PRT;Methanopyrus kandleri>
 MSPLRVRLYDYRKADVERATFIIETSAEFVNTIRRALYTLVPTLRIEEEVIYENDTPMY
 DEMLAHLRLGLIPLRVDDIDQFELPDLCDCGGKGCEKCQVRAELEVEGPTKVYARDL
 KFDHPDVEPAFPDTLITEVGEDQIRILEVIAVPGLGLEHAKWKPVSAVGKGLPELEI
 10 DEDKLKEKKITYECPQGIIRIENGVEVHIDEDRLPECRMVKEYERETDGAVRVRLRD
 DAFVFNVEDTGSMSLDTAILKALDAIEHKLESLKKNLQKEVSGE

15

<SEQ ID No.:1475;PRT;Methanopyrus kandleri>
 MTWAPTGPTNVELRKLIRDLLKKAACEYNAPVWRDVAERLSRPRRQRAEVNVGKLD
 GLARRGVIQEEETVLVPGKVLGDGVITQPLRVAAWRFSRTARMKIEAAGGECLTIRE
 LLEENPEGSYIRIIE

20

<SEQ ID No.:1476;PRT;Methanopyrus kandleri>
 LVEYAHSKPVDPEEWTVIDAENAVLGRLASVVAKRILKGERIAVINTEKAITGKKNTIK
 EEWLQKIQRGDPKKGPFYPRRPDLIFRRVVRGMLPWKTKRGREAFKRLRAYIGTPR
 WVVEANIEPERVAEADMSRLGHLWYVTLGELSEELGYQMPGGQ

25

<SEQ ID No.:1477;PRT;Methanopyrus kandleri>
 MGRVVQTTGKRKTAIARAVIREGEGRVVRVNRKRPVNIIEPEMARMKIMEPLIAGEDIV
 SQVDIDVKVQGGGWMSQAEAAARIAIARGLVEWTGDPDLRDAYMAYDRHMLKGD
 RRKEPKKFGGRGARARRQKSYR

30

<SEQ ID No.:1478;PRT;Methanopyrus kandleri>
 MIIPIRCFTCGRPIAHLWEKYVELIEEEGMEPGEALDELGVDRYCCRRMFLSHVDLL
 EESLPYTPPRLGMPR

35

<SEQ ID No.:1479;PRT;Methanopyrus kandleri>
 MRVATLLTCMLALTGAASAGKYFEVTQTPVVVSLQGVPLSDVRVKFTDEGKQVVE
 NILSGLKVVDSEEVQVTNVARKIAEAREGNITNEEYVVGALGYEVPEGKYFVGYLQ
 VKSGEGETKKYVVRYYYYEQKAVIKSAPGFGSFTATVQVLGEYDDKGLPLMTPSID
 PTEVKDEVLLCLPVIKEITLKP AVLQMDWYKILEKAEPGKVFKLAQVHAHGECDKIE
 VIYAPTKVDALQLLVSGEEPLIPTQEDMVSTIVDPYMEELEAVVDTKIDFLKPIQEKV
 QGNPALEILTERFLPTFLKTLGKQILRVKETIVSALMPHTQYVRTFLVGLYMSQYPD
 GVNNTLMARKAAYESPMYEILVSAVKTSYDMMLESLSKSTLSNIIDSIVDQYADEIAE
 40 MVGTTTEDVKQTVEKLTGVGLKDLLTGDYVDYLIKLVALNVLTSMGSMGIL

45

<SEQ ID No.:1480;PRT;Methanopyrus kandleri>
 VSSFANRDVISVRDFTTRKELEELLSHAEEMERVYERGGDDRSLGKILATLFFSPSTR
 TRLSFESAMHRLGGDVISLGGKEAASTAKGENLADTVRTVEHYCDVIVLRHPKEGA
 ARLAAELTDVPVINAGDGANQHPTQTFLDLYTIMKEKGRIGGLRIGLLGDLKYGRTV
 HSLAYALALFGAKIHLISPEELRMPSHILEELEQIGAEVEEHRDLEEILPDLDVLYVTRI
 QREMFPDPEEFERVKGSYKVTRELIEEHARSDDLVLHPLPRVDEIEPDVDELQARY
 FDQVRNGVIVRMALLDLILGGG

50

<SEQ ID No.:1481;PRT;Methanopyrus kandleri>

WO 03/076575

VIVALKVKRIEMGTVLDHLPPTAPQIMRILDIDPTETLLVAINVESSKMGRKDILKIE
GKILSEEEANKVALVAPNATVNIVRDYSVAEKFQVKPPERVEGFLRCPNPNCITNDE
REPVDTV FVRESKKPLEYRCRYCERTVREDQIRELIRPS

5 <SEQ ID No.:1482;PRT;Methanopyrus kandleri>
LSDPRFSYFRTFREVVQRKSFSAEALGITQGT VSNQIASLERFFDARLFVRTPEG
VELTEEGEIALEAIETVLD AVERAKDKIAAVSKEPSGKVRVSTSTVPGGYLLPGSVKE
FRSEYPKVDVIIRVCDSREATEHVLSGDADVAIVGTDAFVTRKSVEVVP IASEELVVIL
PPDHELADAMEVSIDDIVGEPYVNRESGSGTRREVEKY LKSHGLGFEDFKIVEEVG
10 STEAVITSVSQGAGISISERAAKRAESAGLIRIARLEDRPRRFFYALKSDKPLHASAT
EAFWEFLLSEFRGKS

<SEQ ID No.:1483;PRT;Methanopyrus kandleri>
VRVLLLTGRLAADDVRKAAEDFEWA EVKVLPIDVAALMTTRFVIEQLRGEDLTRYDYI
15 LLPGWFRGDVRKLDEALDAFRLSSREARDLPLVLRKMEEGFVPSKDVPACVLLRD
EILRELGRKVRDVERDIPERSWIDVGPVRIARGCRPRVLSEVFADDLSPEEAASEAE
RRAELGAEIVDLGFHERSPEDVRQIVETVRDRVGDRAVVSIDSGDPGILEAGVEAGA
DILLNAFPDLKEPVDLADEYDVPVVLVPENKKPEIAVRQLRELVDLCERRD VDYVLD
PVMDDPPGGIVESIVRYRAVAEEFPEAPLFFGAGNVLELIDADSPGTSALCAQLAVEL
20 ECSIIFTPEASGKTKMSTLELAVASRMCYVAHKFGGFPKDVGLDLVVF KDKRVDSVS
ASGLDAERFASKPQRDVRGDFVILTDHDRGV LILEHRCGDDEPLRLESDDGLELGA
AAVSLGLLSDLRHALYLYGELARAEERLKS YGQYIQDDGIERYDRLLHDLKILEEVEE
R

25 <SEQ ID No.:1484;PRT;Methanopyrus kandleri>
LGLRIGWGITGAAHLLVETFKIMKEISREHRISAF LSEAGEEVVRMFGLWDDLREICP
GGFYREVFTQSEEGASCP IIGRFALGKYDLLIVSPATANTVAKIAHGIADTLVTNAVA
QAGKGDVPVWVPCDYEEGKIRTITPYMVL RERCEGCGICVDACPRSAIDMVDGKA
FIRLLRCVGCCKCAEACPEDAIHG GLEYEMRVRSDAENVRKLERIEGIEVLRHP EEI
30 PERLGELAGEGTPDR

<SEQ ID No.:1485;PRT;Methanopyrus kandleri>
LAEEGSELKEVIIGAPAMADTD RADTYVNDVRDSSQFFGRDARLYFGLNVNRFAGL
ACGMVFAGVLLVPLLLAF

35 <SEQ ID No.:1486;PRT;Methanopyrus kandleri>
VSVSPVRCEPVVDVEEPVEAEVLVSSQRLSFLGGVDPKTGEVVDPSHEL CGEKL TG
RVLVLPGGRGSTVGSYVLMEMADRG TAPAGIVVREAEPILVVGCVLGDIPLFHRPE
RDLVEELSTGDVVKLLPGGKVEV

40 <SEQ ID No.:1487;PRT;Methanopyrus kandleri>
MVERSKEEALFIKALKEKFEEDPEEKHTKFYVYGGYRQSPRKEFAKGALREFEPAG
ERDLIVPAE

45 <SEQ ID No.:1488;PRT;Methanopyrus kandleri>
MEEPENLAVPPSCEAGPCGNSCVFCYIRQNPPEVLREHG GNVDTTRHDTLNDPH
LEERVERARDRYPDRLRLRIVDTAGNVGIDEGRVESLAAAGIDEVQISLHTTVPETRKK
LMGNPNADELLELLPKFEDVGIDVIADLVLT PGYNLRELPRTCEDLETMGARQVRVF
PVG GTDLARGFRFPTRRELEWMRETSRRLDCELNIEVIPSP TIDALLGEPAFDPPDL
50 PEPDFAVIVVGELAAPIFEPAVRELENVELLVKNRVFGGVIGASSLLTAKDVLREIE
RYEPRTFEFVLILPDAMFSPDGR TLDGWSREELVGKLAALGYTVVTCRKPEEVAKV
LASPSPW

- <SEQ ID No.:1489;PRT;Methanopyrus kandleri>
LNLRLTVLSGGTGTPKLLRGLRELEADFSVIVNTGEDDEILGLYVSPDVDTVLYTLAG
IVNDETWYGIKDDGFRGHEFLERLGVDEPLRIGDADRALKQYRTYLMREKGLKSE
5 AVDEIRRLGLIKWKVYPMTDDRVTIVETDEGDLHFREFWVERGGKPPVRGVRYE
GAEEASPPPDVAVDELLRADVVLIGPSNPVTSIGPILSISEIRHIVREKPVVMVSPFIGR
EPVSGPAGKLMRAVGFEPSVRGLVEYYREWGVPEPDVLIMDERDDVELPEGLEVVR
TDTLMRDEKDSVRLAREVLRIVEELVG
- 10 <SEQ ID No.:1490;PRT;Methanopyrus kandleri>
MSPRLVVPAAVVVAIGLLAYWYLYPSEGASEVPIKAKIELPKPLELKMSVSEALKKR
RSIREYRDESITLRELATVLWAAQGITDPRGFRTAPSAGALYPLRVFVVRKVEGLA
PGIYVYDPKTHTLGLVRRGNFTTELQRACLDQEWVGHAADVIVGYERVLPQPRYG
ERSFRYMALEAGHVGNILACTALGLGTAVGAFYDDRVEILGITEGDAVPLYVF
15 PIGRR
- <SEQ ID No.:1491;PRT;Methanopyrus kandleri>
VGVAVRDVRYGRLKLLVFENVYPPAEDSFLLAHQGVSGSERVLDVGTGCGIQGL
SAAAKGCEVVATDVNPAAVHCAWNAHLNDLNIDVRVGDLEFEPVRDERFDIVLFNP
20 PYLPGRELPGSDPISRATEDPAVIRRFKDLLREEIRWDEARIVVSSLTPKKYLEPLQ
RFEVEIVAEELFFEKIRVLALRPSR
- <SEQ ID No.:1492;PRT;Methanopyrus kandleri>
LFVVVYSTAEDEEEAKRIARKLVEEDLAACVNLWPIRSVYEWGGELCEDEEYALLVK
25 TTAERAEVVERIVELHSYETPAVLVLPVLGGFEGFLEWIREQTR
- <SEQ ID No.:1493;PRT;Methanopyrus kandleri>
MDLEGLSLHMLEAGASEDEIRELLTDLVKIWKRDWSEDEIREFVDAVLEEVHHVRKA
HFLGGRVGDILRPPESGVGMGEMGVSGRGEEDFFVHELLTRLAAKASEGALVSPE
30 ERDDAGAVRIDPDEVILVSAVDGMHSRLSEFPFLAGFHATRAAMRDVLVNGARPRG
LLVDLHLADDGDVGRLFDFTAGVTAVGAATGVPILAGSTLRVGGDMVLGRRVLVAGV
ACVGTARPELTTPRRDAEPGDLIVLTEGAGGGTISTTAIYHGYYDVVEETLNVDFVR
AVEALREENLLSEVHAMTDITNGGIRGDATEISETAGVRLVFDEETVRSLVNDRLR
MLDELIDYLGSLDMLMVIAPEDVAERCVEALNGVGVRAVVGVRVEEGSGVVLER
35 DGEEVELDVKFRETAYTKVKRVIGEEHPEEFEEEMKERVRRAYEEAERKLRWVLERL
GE
- <SEQ ID No.:1494;PRT;Methanopyrus kandleri>
VSGAELIRELIMELRALRHEIHMLRVELEKLRSEVNEVEPDDDFSELLPQSEHVPEVV
40 IEDSGLGPDVAGERWRL
- <SEQ ID No.:1495;PRT;Methanopyrus kandleri>
LPYVPLFVRVERAVIVGGGRVAERKARTLVDLGVDVIVVAPEESEWIRDLVRFVRR
KVKGPEDLPEADLYVATDDPDLNARLERALSLVNRVDTTPRPKVRFPVSVLRSGDAV
45 LAISTGKPRVTKALRMIAAELLGPTLRKAAELSEDARKWVSLERVINELEGLRWQDQ
- <SEQ ID No.:1496;PRT;Methanopyrus kandleri>
LTVYVDATDILDPRWLFMGDPDRIYVVRTGHAPMHLHFELKRLVGFRVSVDGNAITG
TVTPEGCLSSCTIPWVAQIVDARPGDDVLVVGPPEDGIDRVFELFPDVEEVEPEEP
50 EPIREPHSNAVMPNRKCKAARKYDTTELKEILKKAGFEIVPSVERYVCGFEAMQRT
ILRGDARIGIAASFDLVSGEYLGLIPVDVHGVTGTPRLNPELRVKTKDAPELLRNLLR
MSPEHRREVYQGRLLEPNWDRKFPNA

- 5 <SEQ ID No.:1497;PRT;Methanopyrus kandleri>
LEPVSFRRGEVKTVIDVGVGTTDVVAYTGDPEYSPRFVGPSRVSTLAQRLRFMLRE
PPRYLALIGVPMGGGPTTREFKRLMKKGTEIYAELDAALTLHNDVRRLEEMPRLHIV
EDPIEEVPPDSPVVETYDFRVSDVFEALQRSNVMDMGVETVVACVQDHGYHPDYE
SNRKHRFERLFRRYLGANGCRPDRMTFDDVPPESFPRLRAAYMEAESAGVDAVA
MDSKVPIAMLGRVDSADADRLVIDYGTGHVTAFLFDGDRIVGVYEHHTIRLSSEKFE
RQIREFVEGKLENEVDYRDGGHGHCHNVSPMDWDELEDIVSLGPKKPEFQLGRDPE
RFPDRMMPAYGPAVYLTDRGE
- 10 <SEQ ID No.:1498;PRT;Methanopyrus kandleri>
VKVVLKAGTGAVKEVDAVKNAITAFEGELLVPPGGWRFANIVREVYEDGDLSDDA
HWMIAAAMDQTYLLSLLDLPTEEPEFGGKLVLLPYRYLRMKDPLPHSWEITSD
AISVYVAEANANLVVFAKDVPGILEDPPDPSSLIREIDARELEGNWTALDPVAPRLA
15 EEYDLELRVYAGNPDNLLRAMRGEEFVGTRVVP
- 20 <SEQ ID No.:1499;PRT;Methanopyrus kandleri>
MIGPLDPLRDYLRLLGEGFVLVGLGNPLAADDGFGHWVARRLSPLKTHKFKAVAA
GVWLERLRPNPVLVDTVRVDREPGTLVVVKEPRLGPDRGSHGPPDELMDVR
LLIGFVPVKSGFGPMSPEAKSVADAVVRVVRDVVLEGTEGPTDRGLRGSAAHHRER
QKSAQTTRGSVRPL
- 25 <SEQ ID No.:1500;PRT;Methanopyrus kandleri>
VILQRDSYSDGTVLGSMCTEPHPVAAEAFVAGLHVNLGDPYLPNAYRAERECIG
WLAETLLDHPAPEEAEGSIVSGGTEANILAAAYAAREVTGGREIIVPATRHSFEKAAR
MLRMKLVEAPLRSDYTVDDAVQDLISRDTALIVGIVGTTETGSVDDIEALSDDVAEDH
GVPLHVDAAFGGFTAPFLREEYPLPRFGFDLEAVVSVTVDPHKMGLVPPPAGGIVF
RDDEFKPAIEVYAPYLSGGGASQYTITGTRPGAPVLALYANILELGEEGYRRIAFRCY
EETLKVAEKARELGLELAVDPPHLNLVNIRLPDRGTAERLLRESEREGWKISVSTKP
30 LGVRIVMMPHLDAETVSRFLELVARVLGG
- 35 <SEQ ID No.:1501;PRT;Methanopyrus kandleri>
MEEGPIRVPNELKDRRELMKSLILAFIGLRQPRVHLGDIGGELGVSLQAIHNYVKELI
DEGLVEKKGRAEYVLTDKGAEKALASINNIRRFSAKIAEALGKRMTWAAIAAEDIRKG
EEIYLYMEDGLLYASKSRKTGARAIQAADAEGQDLPVTNIEGDIPGLERGEVVFVC
VPSAREGGTRKLDLDRLEKEVLEKEDYDLIGAAGTAARAALNMLGIEPDLKFGVVDGA
IMAALKGLKALVVITTPMLRRARDKAERRGAERYRIQYV
- 40 <SEQ ID No.:1502;PRT;Methanopyrus kandleri>
VNKGEDNLVRTSITVPEQLLQKVNELIASGYFASRSEIFRQALREYLQRIEWTERVG
DEEYFGALTYVFQHERAEPELVKVQHEFTDVIISTTHIHVSPEKCLEVLLQGPGKRI
AELAKRIRGVRGVEQAKLTVVSSEGE
- 45 <SEQ ID No.:1503;PRT;Methanopyrus kandleri>
MKVRVGTTPVVKVRATERAFLRTFPDREITVEAVSVDPGVPPQPVGMEEVHQGAK
NRAREAWNRRGSYSVGLAELIRVGDVYDLHVAVVRDPKGRETVGTSPGFQLPPD
VTEEALSGEEVGEVSELVGVREIGKRSGAIGVLSNGKVLREDLCELAILMALIGLET
SR
- 50 <SEQ ID No.:1504;PRT;Methanopyrus kandleri>

LTPLARFRKVVGGTFDRLHLGHQRLLSVALELGDRVVIGVTTDSFVREEGKKGVE
PFEERVRAVRRFVEEKGASDRVEIVPLEDRYGTTLDDMDAIVVSPETEPVALEIN
ELRRKRGFPLSIVVIPFVLDGDGRKISSSRLRGEVDEGPCRDD

5 <SEQ ID No.:1505;PRT;Methanopyrus kandleri>
VVVQAWTDLKVRLLRLDASREILERYSRQPELEGVLRGIEIEKARLHGELPWDYW
ERWEGEPRDMRITVAASGGYDSTASAILRKLGYEESVTVDPGPMFLPPKLRRN
VEILSEYLGTEPKFVEEDLSDVVEGALNEGRFHPCGRCNAKIRKRVMGeadtdvva
10 FGDGLPTGHHCVPEDDRFKLHVPAALAKTKFELRRLVEEVLPFHDYKYACPFLH
QVHQRHPLRRASIQRVLRHLRGFLEVGEALKAVYDILGG

<SEQ ID No.:1506;PRT;Methanopyrus kandleri>
LKA VINRSKGT VLAHSAEIAESFLARLRGLMFRRL EEGEGLIKPPYRGRRRCAIH
15 TFFMRFPIDVFLADGEVVDVVERLKPWRVYVPEEPPEEIVELPAGIVSATDTEVGD
SVEVVAGDLESELAVRILNRKLVTRKLAQVIMRAVAKSGLQGEVFYKDTGCIHISG
EDKYIVADTIKETFGDSVEIVEGRAKILSDDHSLVVIVKDAHSVLEKIGISRPGGELMY
RKEPKPVRWVGKQREKGADDGSEQAEEDRNEGEGRTRHRGRT

<SEQ ID No.:1507;PRT;Methanopyrus kandleri>
20 LNFVETFRRLRCLQPSAVVDFDPPAESLRSTPVIKLP SGILHSVGPVEACASGLK
EGEPVLIASYSRCSLEFRPIRPEEARLAALDHYRVVSRILETMVELAVEGVEGDRVG
TLCVISEGADRM YRTTPVRVEDVNVMTGSGKRVLKALAKLDGAI VVDPEGNIEAA
GAIFD VDSGSVEPGFGARHTTALHVSKE LNCPVIVLSESGRIRLYHGGKEVLKISVSD
LVAIRGFCDG

25 <SEQ ID No.:1508;PRT;Methanopyrus kandleri>
MVRNIVVETMKRSPFTETETEVEIVERKGVGHPDSLADGIAESVSRALCREYIERFGRIL
HHNTDEVQIVAGESRPEFGGGEVIRPIYILVTGRATAYVGDEEIPVGTIALEAATEYLE
ETVRHLDTEKHVVIEPKIGHGSADLRDVFERGEVPLANDTSFGVGYAPLT TTERLV
30 YETERKINSPKLKDLPEVGEDVKVMALREDNKIELTVAAAMVSQRIDDIDHYISVVE
ELRDRVADLAAEIASDHDVEVHVNTADDYERESVYLTVTGTSAEQGDDGSGVGRGN
RVNGLITPFRPMSMEAAAGKNPVNHVGKLYNVLAHQMAREIYEETSADEVYVRLLS
QIGHPIDDPKAVDVHLVGDVSEEDERVARRVADELLENITELTERIVEGEIEVF

35 <SEQ ID No.:1509;PRT;Methanopyrus kandleri>
VRVLSEYKKGAGELLREHGLSVGDRVIRVDDGVVVEGIIMPRSELGDDEHIVVKM
DNGYNVGVVRVDRIE KLEAPGEGHEPSFKPMEGEIEYDPKLPNV SVMSTGGTIACRV
DYETGAVKPAFTA AEELVGAVPELLDVINIVDARAVLDLLSENMEPKHWMKIAEEVVD
ALSDPDVEGVVIGHGTD TMAFTAAALSFVIEGLNGPVVLVGAQRSSDRPSSDAASN
40 LIAACAFAGDGEVGEVTVCMHGWTSDDEVCLVHRGVRVRKMHTSRRDAFRSVESIP
AKVDVKDLRNP KIEFLRSDYRRPEDGEPEISGGFEEKVALVKFAPGMDPEVLD FYV
DRGYRGIVLEGTGLGHVSEQWLESIERAVDDGIAVVM TSQCLYGRVNMNVYRTGR
LLRAVGVIPGEDMLPEVAYVKLMYVLDRTDDI KEVERLMRTNIAGEIEGGRVLGGFE
PADGPHHRL

45 <SEQ ID No.:1510;PRT;Methanopyrus kandleri>
LKVAIVEYGVGNLNSVYRAVKHLGHEPVVTD DDPSELHDADAVILPGVGNFRAAAEKL
EETGLCDEIRELLGSVPLL GICLGMQLLMESSEESPE SRGLGVFRGTCVALPNDVKT
PHMGWNTVEFRTEEFREFD GEMFYFVHSYRVAPEDDVVLGETEYGERFPSVIGDR
50 GRLIYGMQFHPEKSGPVGLKLLGEVLTGASR

<SEQ ID No.:1511;PRT;Methanopyrus kandleri>

LRMSRERIFREVKESLKNIEVRSELGDNVSLSTLRYILASMVITLGRGVGSTFYRAG
YDIGVYKAKSHDLKGIEEAFEYVEKAFERTGTGIERWEMKEDGKIEITMRESATAAG
YDIGKKLCYYQAGFIAGILHGATGERWEVHETKCMAGHDHCEFVAIRRG

5 <SEQ ID No.:1512;PRT;Methanopyrus kandleri>
VERVVHGTLMDFGVGVLLVGPRGVGKSETALELIRRGHRLVSDDAVIVECDDSY
EYPVGRPPENLAGKMEIRLALAELYCPECGRVYTFSALKMKEGCD CGGDLKLRPIQ
DKIAVDVAELYGIRALRSRKIGGVVIMIPGPHHPHDPMPDEPVSSTPSEEEKV
VKWVKERDGRVFHLDVVPGRDTATLIETVALQESLRRRR

10 <SEQ ID No.:1513;PRT;Methanopyrus kandleri>
VVLSDPDLGAALLLSLDELHTGLVWGALRSQYLLLGAYLRVRHSALFVWLHETL
EFLFHTVILSLILPVPMAVTAASVHFGIDLFHEALLGTVKGRVTHRLMHLSLESAILYW
LWG

15 <SEQ ID No.:1514;PRT;Methanopyrus kandleri>
VRILRDLIGKPVIDSSAKHIGEVLDVEFDEESGEVTTLIVGHSKRPGVLRKIKWLGGE
EKAVRIPYSNVVAIEDMVLVEGRWVSRED

20 <SEQ ID No.:1515;PRT;Methanopyrus kandleri>
VLEPETFDVDPDIRPMSGHHDELVAVLKALGDERRIAALEILGHSEECCLKLAELGE
NQPSTAYHLKKLLEVGLVTKRSEGGRTFYRLTERGERVLKVIRDLKDQLRRT

25 <SEQ ID No.:1516;PRT;Methanopyrus kandleri>
MPLDPLLAAYLAVALDLVLGDPPNRFHPVAWCGRVMELVEKRVRRGRVLDVWVG
GLTLAVGCGFLLGVCYPLHYIPMVGDALVLWVCISVRGLVEHLLPVERELREGNLDG
ARQAVRWLVSRDVSRLNGAEVASAAVESCFENLLDSVVGPLWWYYLLGWPGAVM
YRATNVADAMFGYRGEYEMFGKIPARLDDLLNVLSLPVCAAALTVTLPWWILRARL
RSLRAARDVPSPSSWLPMPYVGACALGVRLEKPNVYVLKGGDRLPTDDVRRAAQ
30 IAVIFGLVAPGITYVAAGLLSP

<SEQ ID No.:1517;PRT;Methanopyrus kandleri>
MTRCTSAESYDEDEVPRVVESLNVGRVLVQAPDGLKRIAREVADVLEARGCEVEL
DAGR VFGACDITPGTVVRTDHIVHIGHYPIPEVERQIRELGATVHFLPTHGRKRVEP
35 WMAEEAVEVLHNLGIDRVNVCATAQYVADLELVSEILRESGIEPVIRPGDGRRVATP
GLVLGCNFSALDTS LPTIVCSGSFHPAGVAIRTNRPVVQIDPTKGVLDSEDEDVIR
RILAVRLSKIREFNREEGFESTALGQRRPDVVRVLD RPTWRLRYLTEDALRSR
RRQCVFCGCPRPVDEAARFKRWVLLNPAELAAVRAGWKEYRLDEIPTPEDVLNA
LRR

40 <SEQ ID No.:1518;PRT;Methanopyrus kandleri>
LYALGVGMRRRVRRQDLVTAVRWGLEEAGELGEIITITRKRDQPSGKALVEIGRRF
GIPVRFVEKLADHTPSDSRARDLLGAPGSVCEGLITHGYEIVRPKRTFGNTVTAAL
GWKRSRK

45 <SEQ ID No.:1519;PRT;Methanopyrus kandleri>
VARVLSEAIKRSGRTVGVMLPQSTGGSGRKWVGGRWDCDVVATVDRVSECD
YALILSRFGACTNARKAVYDL SHQSFGFEPPEGWVGIDCFRVARDKRVPVHALIL
LGAMCRIARLCELEDVKKALLSEEGR LGAVSYRAVRAGWEEAGRWC

50 <SEQ ID No.:1520;PRT;Methanopyrus kandleri>

5 LKPKVVDLFCGAGGFSRGFKEAGFKILGGVENNPAPAAATYRENFPEAEVIERDIQRV
DSEEIVDELGEPDVIIIGPPCEPFTAANAERKPNPLDRLYDDPVGRLVLHFVRIIGDL
QPEVFMENVPAIMEGGLEKALRKEFARAGYDEIHFNVLQAVHYGVPSYRRRVFIS
NVRIDPEPTVERPKTVWDAIGDLPSDSEVPNHRLRPLSKRKLRRIRRLRWGEALS
IRGARGSFKNWLRRLHPFKPAPTVMGGSRFIHPFEDRLLTVREQARLMSYPDDHVFE
GGYETQYDQVGESVPPELARVIAEEVRDHLA

10 <SEQ ID No.:1521;PRT;Methanopyrus kandleri>
VRKVPIAIGILAVVVIAAAAGYYTSSNQLTVFAAASLKKPLTKLAKQYEKEKGVKVAL
NFGPSGGLTAQILQGQKCDLFFSADWKYVVKLQKAGKTAKTKKFLKDYLVLVVS
GEKKGIKSVKDITKPGVTAVADPKAPVGEYTQRALEKLGWIDKIVKGNLKARPGT
VNQVATMVKNDQIDAGFVYRSVAVGFGPLIVQMFPHSLTGPIIWGA AVIKGGNEQLA
EDFLNYCLEHIDEFKKYGWSPA

15 <SEQ ID No.:1522;PRT;Methanopyrus kandleri>
MIGRYEILSTLFPPLFFIFIVFPLVALVLNLTPQGIAEFSDPYFWSATFNTILCAVAAA
AAGVIIAIGFGYYHLFKRDSVIYRVADFLNDLPALPHTVAGLALLAFGRNYFGWLGE
NGLAFTLIAVVLAMLFVSYPLAARAVQAGVEELGRELVDPARTLGDEPPKAYVRVVV
PALQEALLGGFLLGFSRSLSEFAAVIMFGGNLPGRTQVLASYVFTRAESGDLEVAVA
20 ASVFCMVLSTLMVALVRSVTGGLRRAEG

25 <SEQ ID No.:1523;PRT;Methanopyrus kandleri>
VLRVEGVKFSYGDREVLRGVDLEVEPGEVRVLFPGPNGSGKSTLLKIVAGILRPDEG
RVIIGEEDVTDLPPEERHVGYPQQPALFPHMTVEDNITYSLQNGRGPDRDELV
ELLGLKEHLDRKPDELSSGGYQSRVSLARALFSDPKVMLLDEPLSDVDLAVKAGLVP
RFREVLKETGIPALYVTHDPWEAERIGDSFTVLIGGKAVDVNSVDEALEELKRGVES
VKA

30 <SEQ ID No.:1524;PRT;Methanopyrus kandleri>
VSKRKYRGFVYTDDLAKPEEFIRFLRRFLSPPEPETVEVGPELSGRVLAEDVRAERP
SPPFTRSAMDGYAVRSEDAEPGARLKVVGESRIGEGTDVKVGPGEAVYVDTGAPV
PEGADAVIPVEFVERDGDDEIIEEGVDPGDNLDPAGCYVEEGEVLYRSGHLVEPVD
VGVMLEHGVVEVDVHRPLRVSVVTGNELVHRPSELESETQVVCIGPVLTAELN
MGCVEVVGTSVLKDDPGEIRETVEDYADRSDVVLITGGSSVGERDHVKDILDDTFD
35 AFIHGIRARPGRPFGIAAREGTVAFTLPGWPTSCYSTFRVWVPSLLVLGADPLVV
GFETEATGIKSKREVGVIARVRLTSDGAEGLSRDRSSHFAFRETDFGALVPPGGS
ERALILPLRGFLNLFDEVERKF

40 <SEQ ID No.:1525;PRT;Methanopyrus kandleri>
LVKIVIHEERCHGCGNCVIACPVNACNSPNVWGGKGPEDGEDVVIKVVNGTVSVIN
EDLCEACMTCELACPVDAIEIKT

45 <SEQ ID No.:1526;PRT;Methanopyrus kandleri>
MAEFTLLTGRTIWQGEAIETDKAGEIYPNATAICYFNPKDMSELGISEGDPVKVSKY
GEVIVRAKAADTDVPPRGIVFIPMGWANKVVDPNKSTGMPGFKGIKVEIEPTDEE
PIEDMSEFMRSEYLSE

50 <SEQ ID No.:1527;PRT;Methanopyrus kandleri>
VARKVIKDVVCPFCGTLCDDELVVVEDGEIVEVRHACRIGAAKFLTAQEDHRHTEPM
IKENGWKKIDYEDAAEETAKMLVEAKLPVLYGWSATLVEAQEKGVLAELVGGIID
NTASVUHGPSVLGLQDVGVPSCITLGEVKNRADTVIYWGSNPMHAHPRHMSRYTAF
TRGFFRPKGREDRTIIVDPKRTATARLADVIRVRPNEDYELISALRAAVHGIEIERE

EVAGVPTEQIYEVADLIKEASFGLFWAMGLTMSRGRHRNIDNAICLIKDLNEYTKW
TLIMMRGHYNVTGFNEVLAWTTGYPYAVDFSRGYPRYNPGETSTVDLLTRGEVDA
MMVIASDPGAHFPRKAVEHMARIPLVCVDPHWTPTAELADLYVPVTIAGIEWEGTAY
RMDSVPIRMKVVEPPESMLNDVEFLEMVIEKVEEM

5

<SEQ ID No.:1528;PRT;Methanopyrus kandleri>
MELRCPYCGSRSCVNESALSFLRASERAARYVVKGRDDVDEDPNFRPSFGEVGI
CKETSKRIWVCPYCHSLIPELPGMTARCEPCGREANVAPSRRKIVC

10

<SEQ ID No.:1529;PRT;Methanopyrus kandleri>
LAKELLIKNACVYDPLNGIEGEVMDIGVKDGKIVDPSEVDESKAKVIDAEGRLTMAG
GVDIHAHVAGPKVNVGRIFRPEDSRRLQVAIKKLGTRSGTGFSVPSTTITGYLYAQM
GYTTVMEAATPPLLTRHTHEEIRDTPILDEGAYTLMANNWILYEYIKEGELEKAAAYA
AWLLRATKGFVIKMNPPGGTEAWGWGENVHSLDDPVYFEITPAEIYQNYVKINEM
15 LGLPHSIHIHPNLLGEPGNYEITDSDWDVIKKTGVEPNPEIGEREQVVHNTHVQFHS
YGGDSWPTFESKAEVAKYLNKNDHVTVDLGAVTLDETTTMTADGPLEWELQELT
GFKWANYDVELETGSGVVPFIYSPKNPVHVSQWAIGLEIALLTENPWQVWISTDHPN
AGPFIRYPRIIAWLMSEPYREEWIENVHPWVGQRAAIATIDREYTWTDITITRAAPA
KMLGLSDRIGHLGEGAYAHIAIYDIKPDEVDPSTRDYEEVEKAMEQAWLVVKDGEIVV
20 QEGVVVNEPVGRTYWVDVKVPEDLLEEVKKDLETKFRRYYSVNLGNYQVQDVYIP
KEERIVIDARDRLS

25

<SEQ ID No.:1530;PRT;Methanopyrus kandleri>
LKEVVLTPKGEPDVPLEAEVICPDEFAGKSEGEIEALKIYEGNSTVELGEYFDVEGDA
GDSPGDTRIVIEGDVPWVKLIGYRMSAGEILVKGDVGRHAGAEMKGGKLIVEGDAD
DWLGREMKGGEITVHGNAGNYVGSTYRGEWRGMSGGRILVKGDAGDEIGEWMS
DGKIIVEGDAGIMIGIHMQGGTIIVRGDVGVRPGAQMEGGTVVVCGRAEDILPSFRY
EGLKEDPVEEATGTFHLFTGDYANGPKVEGELYLSTALNEVPR

30

<SEQ ID No.:1531;PRT;Methanopyrus kandleri>
VKTLRMSPEELLEYFRKEVEEGDRLELNIAFVHIPGEVVKITRYRLHLYVESEVAPGI
RRYDLEEICSMMLLEVIHEPKEGKPKIVVEGADESPGIGIL

35

<SEQ ID No.:1532;PRT;Methanopyrus kandleri>
LTRTAYVLLALLAALVGQASAASVGSQTLTDTAMQWDQQQNKYVDSDDVAARDGY
YQVKGPAAVAVDSTGTVLVAWEEWSENGNVVGKIGLRTPSGNAVYVTPAQDCVYFA
PALTSYDQKGKFLAVTEVPQSNLVAQDYGKLLVYKVDVSNGQITVGSSPVQVADNA
AYPHVVYLGSDNDNRYVAIVYERWNGETGDVELQVLKIDTNGNIIPVLSQPLVIAEG
VCKDYVKGDVHYFGHARPVASLYQEGDSKYLVVLTNYSQATPNVSEWGFYGEWK
40 GCKVEAYVVDLPDFSTIGGLSSENVHKVQGSLSASEDTNECPWVCDNVVVYRVGS
LWGGMSGDTTIPDINAALIVKSRDSWTFSSDTTIYRRIYTQTGPAVARVYTNNDDKT
PYYLAVFADNSGGFGKERLTGVLFRVKDGIQVIAQYDLTGFGSGYCYCPTVATV
KSKYGDAELVVACYKGDSSGGHNIGDAVMLTVSIGDPVDEFMSSAAELLNSLTGT
VDVVNNAIFNSYSGLKKKVSLEKKSNELTQTTQELQNKVSTLEQGQEELKQEVSKI
45 SQEVSGLKGSIDECKNTVENLEERVKKLERRKIAVSPMAVLAAALTAAAYRRYGRQ

50

<SEQ ID No.:1533;PRT;Methanopyrus kandleri>
VPRRCRPPSRRYGLNFYFLHLPYVVGSLRSGSSRLKVWGSEVRVVLVATIAVLITAA
PTTALDWKNTEPYKELQTECAVAKAGTVWWFITDRGGPYLASAHLWNPQLTFG
YELKAISLVYPTLESAERAGLLADRVPAAGVPAMTPTSEWSKASEEAVRWVLDNQNE
DGGWGQAWTYRGITHSGSLTSDTAVAIMLLIHEIERRHESGGEYSELVSAVRRLT
WLLDQQLDGGWSRKREEAREGAPWHTRAABAALLMALERRDLLNLDSDAVDRIK

SAIERGVSWLLERQNPDGSWYSGLMCQEYSADTQAYILSTLIDVYLKADRLGLHVD
RDRILNAIRRGIEWLFGNGEEAGVTWVEGSHGRGPAWAYSSAYLEAQGSPETTVTG
NVLSLVLLKALWFDVATDVEIETPGGKRKLSDLVTDPEYNLHATVEWLVSQRYRGT
EHPEWYGAWPWPAVDVTSTTEGAHYEPASIWATAYAMRALEAYLNPELFYGKITK
5 PNGNESVSKTERETVSGGTETEGNKRQEKSARGVPVLLPAVPPVRRQRQRGGQY
RHR

<SEQ ID No.:1534;PRT;Methanopyrus kandleri>
MGADTSVAPVLILVMVFLAVSVPAHSLDIVIFGNAAKGSPEEIRAVEERVKEDLGVDV
10 RIHVHNVLVSWSDQSAPVDFDSLADIERSEIVALDNMGPMPTPFAMELSERVLGK
PASSMQEFLRELAERKRIVAYVTGDQHDVFILGSGCRRIVDGTAAVNLGFLFRFSS
DLTPVIEFLWLADPSVPAERLHLSDVRISSAAVYVPGRGWEFPEVSGEALMSYH
RWLHALEGRDRTTEPLWTKVRLSSIPSWVKAIREASSQFFRSLWLPNRRVVVLDY
IDALYKGERDLVEKLTDTVYREVSREFQDVTIAVLCGDNMVSPIEALLGLKDAGYDI
15 AAVVSLWAFTLDYPKPGTWALEGIDAPIIKAVYPPFWANWMDEPQRYLNMNEGDPE
SGRVGALFEWGYQVIGGPEPEGAFWFKMIALKERDQMMVFPLEDMIEDVARMVAG
FLRLRYLPESEKRVAFVLYCYPGRGEIGASYLDVFRSLVRIFEALAERGYDLGPAT
SLYRKLAELRREDPKAAEEMEKRLAHALMAASDLVLKNVGPWAKGELAGMVRLYR
GGRAEVSVDWNGKSMKVIVDHGVLRWIDVDGSSYVLGTVSEDQLVPVEALERWY
20 REDVRRFEYYLSLLTGDDPETERARKSLMEWMRAIEEKFGPPTDNRGIMRYGLYY
VIPALRLGNVVVMLQPVRGWSGSELYHSPDLPPQWQYVAAYEWLRRVFRADAV
VHVGTGHTLEWLPGHQVGLGVDWPHVLLPDVPHVYLYIVSNPGEAMVAKYRSGP
ILLTHLSPPWGYFKDLGKYGELERELTRYFQMKSFGGDPHVLEELRRRIVETAERLG
LLKDVNMIFAERKEPPPENPKEWAMDHIEEFIDKLHDFLLDLALRNVAAYGLHVYGE
25 DVDEDVAVEQAAALASSRVAPVFAYYAGLIDSPDQEALNRLQSDRPDIFAWFKREL
RECLRDILRTVLKYPDLTSQLERYVELKDREEYYGEPDGVGPGREAKRLFWQVS
DRLTILAQEAILRYFHGRNDPDHEHLLAEAVADLYRIYVHYRDSGRTELEELLAALD
GRFVPPGLLGEPMWNTKVLPTGRDGYPIDPSQMPTPEAWDVARKLVDQMLADYYL
RHGRWPEAVGVVLWGIHELCTGGLGIAEVLYLLGVRPWWNPDTGQVTGVELIPLDE
30 LKVKGNRWINRPRIDVVVWAALHMEDPLKLLTEAYYLVSHVDEPTDVNYRRKHYL
ELKPRLVKELEKSGMSPEDAKEADVASSGFFAQPPGVYAGTGACDIVEHAWTDV
SGTVGLFEDPETALKNFEQRFWEKFRITCESRMAYVYTAEARILTIREGNKVRVVL
RTSTDRVYHAIPSVEAFRYLMSKVDVVHVSVNTWGLIDTDDFYDWVGGMALYAT
HAAGHAPEVYIGNAVDPTAARTLTGYQQLVGEVYTKLLSESWWKAMLEHGDYGW
35 SRIVRRIEFLAGWGITVPSLRPYLNSVYTEVFKAQQWISQAPPRTEYGWAAVVSTI
AWFVELARTGWKPDSTLAQAQVLLTMAKHGPATCHHTSPNPAALVYAARVLL
EAGYSYSEVKRLLSKVMKYAKLDNPEIVREIERLTNLVMTRAASERSARAATASR
SAATSSSAYTGVTVSRTVSSFTGPGPLGGGSAQVVGLLGSVLRGVARGTVLPEI
GYWTGPSRYTGHAKAGSRVGKTERSTERESKATQTFTRTSPSSAPKMIWEWVA
40 ALLLTLLFLLVWRIRPTGPRPRATWVTPATVPPVAA

<SEQ ID No.:1535;PRT;Methanopyrus kandleri>
LEVHKFGGTSVASEEGLRTLEASAASGHVIVVSALAGVTDALEDFVRRAAEGSADP
45 TPILERHREFITEHLEQRHEEVESFLKDMETLLHGVATVLEQLGRPEERLRLVLSLG
ERASARIVAAYLKERGKAMAYDAWDVGLVTTDDPGNADIVGWDGTRSRLRLDLRS
GRVPVVTGFIGRSDRGHVTTLGRGGSDYTATVLAGVLGSRSVIWDVDGIMTTDPE
LADAEVVERLSYEEAMMAGASGAGVIHPKAVEAAKNLGVTVLIGNSFTGEIGTVISD
STEPGPKVVASRDDVALIRVSGAKMVDEPGVVGRTVSALGNAGVNLLAVFTTVSEP
YINLLVEETALRSAAEALNGLDYDWEVDKDVGLVTVVGEGMSARDVSTFLAACEGF
50 DLLGSAHGVAVSVVVPESEVREVRRLAERLLA

<SEQ ID No.:1536;PRT;Methanopyrus kandleri>

VNATRGEVGSMDVEIETEVVPTDTSVVIDGRISRLAEEGYLEGKIVVIPRAVLSELE
YQANRGRETGFAGLQELQELQRLAEEGIIIEFAGERPGLEEIRLARSGEIDAMIREV
AREYNATLITSDKVQAEVAKAEGLEVVFEPITRVGETEIERMMPENAMSLHLKENV
PPKAKVGRPGEWKLIELRPEPCTREELEKWAREVIEKAYTDEKSFVEIDRGGATVV
5 QLRNLRISIRPPFSEGWEITAVRPVVKVSLDDYDLSEKLKERLRERAEGLVAGPPG
SGKSTFCAALAEFYAEQKIVKTMESPRDLQVGDEITQYAPLDGDMECTADILLVR
PDYTIYDEVKTKDFEVFADMRLAGVGMIGVVHATRPIDAIQRLIGRVELGVIPQVVD
TVIFIEDGEIKKVVYDVSLTVKVPTGMTEDLARPVVEIRDFETGELEYEITYGEEVFV
VPVKGEEEQETASERLAAEVVEREVRFRIGGRAPVDVEVKGSQATVYVPEHVMVM
10 VIGKKGRNVEQIEHRTGLKITVCKPLEERRGERPQPAGSPVPEGEVIEVESGERFP
MRVDDGEYIRLQLGDKFSGRPVKVFGDEYVFTATVGSSGEVRVNKDTSVGQRL
EEALHKGLKVRAQTIP

<SEQ ID No.:1537;PRT;Methanopyrus kandleri>
15 MSHVPLDPETARKVTSSLNRYFEIGGEPLVIAIAQDAENGDLMTAFANEEAVYRTL
TTGYAHYWSTSRREVWKKGEESGHVQRRVVEVRVDCDKDAVLVVEQEGGACHT
GYRSCFYRRVTRDGSFEVVM DRVFNPDDEVYR

<SEQ ID No.:1538;PRT;Methanopyrus kandleri>
20 MGVTLMKVERPKGTRDFTPEEMRARRWLERYLLDVFRSYGYEEVLTPTFEHAKLF
EEKSGEEILEEMYVFKDKKGRKLALRPMTAPVVRFYNAELKTRPHPLKLAYIVNCF
RYEQPQRGRWREFWQAGVEVFGSDRPEADVEVIELTYRIFDGILPSGAFEV RVGHL
GILRGLLEEY GIGEDVQNKVAHLVDKGELDEVKTLLPAEPAEKALAVVTARSESEVE
EAVSGKERAERALENLMEISDALREAGVDHELDFSVARGLDYYTGMVFEIHVPELG
25 GGSQCAGGGRYDDL VKELGGPDVPAVGMAIGFDRLLLAELYDRIPDGVETTRALL
IPLVRSGKIWEIAAKLRKLGWVVNVEVSGKHIRKALSLADSLEYDYAVIVGERELKEG
YVSVKNLKTGVQEEVPLDQLERAAEV

<SEQ ID No.:1539;PRT;Methanopyrus kandleri>
30 VTSRDAKTYEEAVEIVLRTL VKAERIKPTQYARRLVMKEMNPSREARSVSAGLLYSV
LQKRGLLDEVIEDVLEITDDVTDLTWVRNAARIAVNEVVFEDGDPDEVADVLHGLV
RRLANPGAAAIVKAFTLDLKDYEPEPEDELDRLKWEYYHPRWLIERWMEMFGDP
DEVVALLEANNRRPPLTIRVNTLKVDPPEELAE RLQRKYRVTVPEGRFLDEILKIPEGL
PIGEMPEWEEGLFVIQDEAAALASAVLNPKPGEVVVDLCAAPGGKTTHMAQLMGG
35 EGKIVAI DVDEV RMERLREIAERMGVLD CIETHLMDGREAPEKLGREFADAVLVDP
CSADGTIPKNPERRWRITPDELERLPKFQYELLKAGAEMVKPGGRLLYSTC SMFPE
EDEEVVRRFLDEHPEFELLEVKVGDQGDFDMPEACRLFPHRHETCGFFIALMGR TG

<SEQ ID No.:1540;PRT;Methanopyrus kandleri>
40 LRDALGREVRSVRISVTMR CNMACVYCHREGERPGRSEL SAAEWGRLLRACAEIG
VRKVKITGGEP LLRRDLIEIENAEGFEEVSLVTNGVLLADYAGDLAEAGLDRVNVSL
DTVDRKLYRKLTRSRFSPDDVIRGIEAAVSEGLTPVKVNVVLTSETVKTLPTLVEELA
DLEGLKLQLEPMGSIPGFRPAHAEDGLRALGEYEPELERV RTFHSREYRLNNGM
AVEVVKPMDGVMCEACTRIRLTHDGKYKGCLMAPPKPLPRDDFGELVRTLKEYVR
45 TRDDT FEVHQGTSVMGRMRGDVSGR

<SEQ ID No.:1541;PRT;Methanopyrus kandleri>
MSAYSLPWYSVWAHPFIAGKAIEEYGAVAGLPAVFLGIVPSAERWVRGDYKVEYG
WIVANYQGPVVLIRGSHLYVKKPGLVWGRKVPKVAVKVGSDIEVEGKRMTFE
50 EAAKKYGWEKLKYLKADVGERATLVYELKFTDGRRPMDENEVKKVFG EAAAYRRM
VEMADYS AVVWIGKYRKKLIGHAETTM EGIGHLDNLRV VNAARMCRGWNGVIVPP

HTWTHGKRQYFDVFEVPGYEKAAHGCCPPARALRDACLDAGLPKPKGIDMGVHP
MEYGFHPTEGVVVYNTKPYPIILIEIGFKGKPKIGGIIFCNIYALLPA

5 <SEQ ID No.:1542;PRT;Methanopyrus kandleri>
MRITWLGHAAFEVEIDGVNVLIDPFLSGNPKAACKSPDEVDPLVLVTHGHGDHLGD
AVEICKRTGATLVGIYEIAVYAQQQGVENV EEMNIGGTIEVEGLEITQVPAWHSSEIV
EDGEIVAGGTPVGYVVS GEEG SVYHAGDTGLSMDMKLIGELYEPEVALLPIGSRFT
MGPKEAAKAVELIEPEVAIPMHYGTFFPIEQDPEEFKREVEELGLDVEVVILEPGESY
ER

10 <SEQ ID No.:1543;PRT;Methanopyrus kandleri>
LRVSPSEGARRVWRAIKTELSEHGPELGRLEEELSAAVPEDAEVKEIRAYGYRRSV
GIFRRINRLWILIRGDESVAKDMERNLIDRIVEDPKVRHKLNWALRGALRVTTID
DVRPEPEVIRRVTTLCALCGAASVLLGIEALAYPKRVVKLLPPAIAVSGAAGCLLPW
15 RVGLLGLADDALDHPRRVTPVAVSLTLLVLGLVSSLLLPYLGTGFLGVVIAACVTG
FVAARFVELINREVVKVE

20 <SEQ ID No.:1544;PRT;Methanopyrus kandleri>
VSKVRREHGAGGELMESLIKEELLPNLTMRGEGSVTLDDLDDGATFPSVDGEMVM
TTDAHIVDPFFFPGGNVGKLAAAGTANDLAVMGAKPVAFACSIVVREGFPIDDLKRV
YRSIDGVLSLGAHLITGDTKVGNTGDVDIVTMTGVGEIVELVRDCGLRPGDKIVIT
GTVGDHGMALAAQQGLD TDLES DVAPVWEAVNAALEVGGVTS MKDPTRGGLAG
ALNEMAEKSGVRIVIEEERIPIREEVRV LSEMLGVNPLEVANEGKVV MGV RPDMDVD
25 VLDAIRSTEVGKNAEIVGVVEEGT PRVEMETEVGGRRIVEKPV GDPVPRVC

25 <SEQ ID No.:1545;PRT;Methanopyrus kandleri>
LGVWHGRSLRKPTGGRRIPHRKKRK FEMGNPPTETLVGEERKLKERRGMGGNVK
KGLKFATHANVADPETGEVKCVRIEEVKNPASQYYERHGVITKGAIIRTEIGLAKVT
NRPGQEPVVNAVLIKEEEEEEG

30 <SEQ ID No.:1546;PRT;Methanopyrus kandleri>
MHKVEVDVSEDLLLEVNRNLAREVRETLD EHNVR AVEVLGSIGSGKTS LIEWIVKEYG
DEYSFAVIAGDVVSEYDERRFKDLGVPTVGLNTGRECHLDAH MVQHGLEHLEELTD
LNEVDVLFIE NVGNLVC PADFP IGAHLRVIVVSATEGEDVIGKHPMMIRKGDVLV VNK
35 IDLADACGVSPETMVRTAKEINPDLEVYLT SIKTGEGMAELAERLLP

40 <SEQ ID No.:1547;PRT;Methanopyrus kandleri>
LHELVAQSVLETVLDVARKRGAERVLSVRLRIGEF TLLNPEQLRFCLEVLAEGTPV
EGAKFEIEIERGYFKCAECGHRWRPEDESLKDPSLHTAFDLSEL TELDLKCPKCGS
RAVKLDGGDACSIESVRLEVPGEQHAQG

45 <SEQ ID No.:1548;PRT;Methanopyrus kandleri>
VAGKLVLVGAGPGDPELLTFKAAR AISRGDVILKDR LVPDEI IKEHAPEDAEVIDVGK
KPGGEGWTQEEINELIVREGSKGKT VVRVKSGDPLIFGRGAEEIEVALKHGM DVEV
VPGV TSAIGVPTSLGLPLTHRK CASSFAVATGHEDPSK PENRVDFGALAEAA DTLVV
LMGARRLREIAREILEKRGNEPVAILERGTTEQERVKVG TLEDAAE GKLKARPPAVV
VVGEVVKWWREVLGRETR

50 <SEQ ID No.:1549;PRT;Methanopyrus kandleri>
LKAKVRTFRYLWHLLRDVISVPTVKYAVAYVAALLCLGTLGYWTLEGRSPVDAFYTT
VLILTGVGCANPPTTPAGEIFTVGLLAVGLGALIHISRVFAALLRGDVLLRIKESDAMA
RIERM RDHVVICGYGKKGREIARNLGEHGFEVVVDKDPEKCDRAFRDGH LAVQG

DVTSEETLLKAGVERAQAVALVTDSDETNVFACVLVRDLNPDWIVAAARSKTGAR
TLLRAGADEVVRVYEAAGIVIANRLMDPLSFLVTVRHPLEDTFREFREIIRHGGIVVD
VRYHIPSLPEPLVKDLWVEDESDVKRRLEMHEDSETREALERLHRMSDDVHSHRIIV
RREEDKEKIVEALRRLXXXGVDMTHKEVLKEVFGVEA

5

<SEQ ID No.:1550;PRT;Methanopyrus kandleri>
LRALVWRAPGLERETVQAFKKVDLDAEVVCPVELVSLDRPKISAGLLSEYDAVAFTS
PRTVEFLSEEEVKELRRSDVDIAAVGPRTREALERAGLRVDVMPTEYTTGKLAEELR
QYGAVLALRSRRRTEDLRRTLESYGKAAEELEMYDLKPKRVEVNPRKFDVVCFLSA
FTARCFLNVDPTEIPEPVVSIGPVTTKELRRAGLKVVEAEHTVEAVAKTALRVIEA

10

<SEQ ID No.:1551;PRT;Methanopyrus kandleri>
VAETPTVKLGKDRIVVWPAYFDADRSRSEGRKVPKRLAVRNPRLTEL RHIAEKLGL
NPKVQRDKRYPKRWWDDKGR LIVDKVESKRKTLLMIAEKLKERRES

15

<SEQ ID No.:1552;PRT;Methanopyrus kandleri>
MLRPF SILAFIMVLGGAAHAISVQEYTWELTAINIKTAEGVIKAKFSKPQTVHFLVPEP
DYDQVDFGRDVG DGIPDHMWCGELASLTLYNVAVAKGWWKPIAGNELTPEDLEK
REEWFAKTTNIPVEDPQYDAPNASTDPPWFPALISLAADPEHPNAIGVVLYAPLTV
SRWFVVVPPMMHAVVVMGATSNGRYFVVKDCSATQGP DYDWKHDYYLV PAYSLE
LNISRAIQDVFNP LEQYSSTMPV LFFPIPTDGKLPGLDEFFQGERTVDVGGGLKVR
FYVFLASTLSDVLEICRH LAEAGVPVMCVVKEPFAWLAYQQGVLEVPLVGTHVLRIL
SVPITAVEIAQPTNSNGAETQNQPTQPKVSNAEGEVEPKENESEANSQASPTSSKR
RKIPLVPIVPALPRGTNRGRDSDGQVEG

20

25

<SEQ ID No.:1553;PRT;Methanopyrus kandleri>
MKRFELDVLPDKPGQLVKVLEPLSKIGGNVISISHSRDGD RARVHIVFEATEDVAR
EYSRRISELEGVKILRFGRGPGHETDVLIGHIVDTDIKDTIDRVNAIQGARVVDVDLE
MPDPERESSAGFTLIYEDEEALRKAVQTIEEIAEEKDLVAIFPVEVIQCVRRASS

30

<SEQ ID No.:1554;PRT;Methanopyrus kandleri>
VRQARL FVIGLGAVGLGLMRLLAKKRDAYAREFGIDVRVVG VADSRGVWVKNDLDP
AEVLKVKQELGTVAEVGESGDAL EIMEDVEFDVLVELTPTDIETGEPGLSHIMKAIEL
GRHVVTANKGPLAVAYGEIMEAAEEAGVVRYEATAGGAMPVFNLVRET LKSVDIH
SIEGVLNGTVNYILTRMEEEGISLKDAIAEAQSRGIAEADPSMDIEGWD TACKVVILA
NAILGLDCTIKD VDTGIEDITPEAIRIAEERGYRIKLIGRADSDGELS VRPCLVPKSDP
VAKVRGVMNIVRLETDVAGDIYVSGRGAGPLETASAVMSDVLSIAESVG

35

40

<SEQ ID No.:1555;PRT;Methanopyrus kandleri>
VMTTATAGAASIYLGK KLASGKEAWKSEGKPLVELGTVLYATGLRLSDSPIPENVAL
VAFRGLEHVHVYKREIDLNVP GFQAQAVKKSVERPD DAFVEALKSMSPTLRYCVD SL
LNHDRKLVVERFSRDILRVMKGALGSSPTVAEILDVIDEHVEEDEGWIPWNPVRALLEI
LGWR

45

<SEQ ID No.:1556;PRT;Methanopyrus kandleri>
MIHTTLWIALAGVCLVLAGIALISAIVVEGTIEATTWFTVADLAVCAA IYVGITGHQFS
SLLPTVGLIVATLMVAHV TYTWIKGILRLVTG RESKSVGERPD TLRAFLTRVLEKLG
YKGKVDPGDREAARRVLET CRRWGWR

50

<SEQ ID No.:1557;PRT;Methanopyrus kandleri>

MADVIAEFLGDGECTVEFEEEEKMELVSGKVAEPGHVTPYHLFLAGILACVTMNAGH
ALEKAGIDAEVTA EVTGEKDWDR LAVTEIEITIKVKLKDDTDPDEARKIAEKGADRCIL
SRTLGP AIVSKEVVVERES

5 <SEQ ID No.:1558;PRT;Methanopyrus kandleri>
VSARGAPSYEDLRRHVLRYTVDDVKVVRLLPEFGRAEVGLADYDDAAVVRVDGKL
VVSSDGPYAFRLVRKSALVHASTDVLVAGGEPRFAVDTHIAPTEKGALEAARRIGRQ
ARALGIEILGGNTMIEDDVEEPKVSLTVMGPLVAPEPITDCGAEPGDSVLLVGEPHIG
10 SFQERMERARRLFDTFPELARRGLVKAADVTGKGLVAMAALVCAKSGVGM DLNS
VPYSSITRNWDNLAVVSPDDVEEVLNVCAERGCPVTMLGEVIEEPVLRIAGRTLVD
SELMAEIEDHFKTFKNFKKS

15 <SEQ ID No.:1559;PRT;Methanopyrus kandleri>
LDVLDELYLRFREAVEVAGHSEIPSQFLQHWVARTLEDALEVVDLCPGDVMLEVG
VGSEVGTFQDRPRRIDILVRDRVIIETKRPGELNSGGRLEEARDQLLRYFAYLVKER
DVRPEDVLAVLTDGKIVVYVEVEKEELVQEGPKKLD RSEFRMIKTILRRIGEDPRPL
ELSRTSVELNPTAVVQWIETWKEVRELLERVKKELTGDGRSERPRGPLL

20 <SEQ ID No.:1560;PRT;Methanopyrus kandleri>
VGGLEAFLEILGLVFVGYTLRKVG VFSKDTPSHLNAYV VYLAMPALVFTAMLRAPIQ
GLLQHLKLVVISMLLSVMCALIGFAVARKMARDRRDAMAVALASGLGNTGFLGYPV
CLSTFGEPGLEAAVFYDFGTTLSVIAAYLMLSSRRENPLKMSLRFPFAHAAVAGMC
WAALGLHLPDTIRSTLQLLGRSVVPVIMVSLGASLRWDLPKSVISVIPTVWVVKLCAS
25 PVVAATIAPSGLDGKVAVLEAAMP PALMNLVLAELLGLRPHVTAALVFSTTVISLATV
PTVIYLVSGGGGA

30 <SEQ ID No.:1561;PRT;Methanopyrus kandleri>
MAKPYDVIVIGAGPAGLSAAIHAARAGAEV PVVAQELGGQLTTAPEVGNYPGFPPA
PGYELVDRMVEHAETVGVELNVKYSNRVEGIELTDGTFRVLDEECRAVVIATGARP
KRLGVPGERELEGRGVSYCAICDGP AFQNRIVAIVGSGTHAANTALFLSEIAERVYVI
TPDGKLESPDRALIERVLSCRNVVVHDEVRRIVGDERVEGVELSDGDILPCEGVFI
AAGKVPNSEPFRLVETDDRGIYVVDSEMR TSLEGVYSAGDVTTIPHRNVPSAVYQ
GSVAGINAAEYALKSR

35 <SEQ ID No.:1562;PRT;Methanopyrus kandleri>
LKVIYV GAGPSGCWIARRVHEMGYDVT VITHPENRLQSERFGHYRVYYGEGLGGS
ARYSMGNFWFWGPEGLRRPFERVLRDMTCEVRRTPDSVVS NLDIEFEEAAEDVGL
EPERMPKSVHFDLCDGCGECLECPRNAKWVPQDELPEGVSVLRDKC IQLEFSGGK
ATAIVLRSQTVELETDDIVVLCAGCPGTPRLLERSGIDADGPLFVDAYIHVVS DLEAE
40 PGIQMPIVDMDEYILSPHRTSAYEGKYSIMVKIAD ELSGDVIGREKPISVRETELFAE
GCAVAGEIISRMGGRVRAVTEPSGAHPGGT LSDRVDDRYALEGYDNVYVVDANVL
PEPLGKPPVGVILAMAEDFCDKLRRSE

45 <SEQ ID No.:1563;PRT;Methanopyrus kandleri>
VILFSSSLSQYEGIELPTWRYVPPVLLAILLSSASPVAAGVAEMFHSEINEFRESLGLS
PLKWSPSLARLAEQHAARMDETNELYHERCQGYNFENVARVPNTGEPTLTARLLAI
TVLSSPPHRWNVLEGNCEGVGVVISG DYAVLSQKISRASDDAVDVRVEVPPFHG V
STAHRRDDVEKAVLDAINREREQSGLPPLVLDKELSKRVLEELREAARTLSVTCSSGT
50 LVILTRLQNPVEIAEDVLGVLRAVPAGRNFWVPKGRLGVAALVTEVTMPDGNRLKL
GVVWVGINVVEEMAGKNRPRRVFPFSYVAIAIPLCYLITRRQTFFTGRPQR

<SEQ ID No.:1564;PRT;Methanopyrus kandleri>

- VKRRINVAIAGHVDHKGSSLLERITGEFPDKEEFELSRGITAVMKVIPTTEWKGVFI
DTPGHSDFREEVGKALLVSDGLVLVAADDGVQARTEVIIIEANELGLPVVLAVNKM
DKEGADFERVVKEVKERGLEPVTAVPTS AKT GEGIEDLLDAIVEHIEPRGWGDPDE
GTAFLVVDVGEREGLGSVATGVVRAGTLKPGDELRYEGEVYRIRALLSPDEKRVRE
5 ARPGDVVLAAMDRAPEAGVLLTETGGYRVENPEDVRPCVRYTVEVDDLKAREVL
EDIERRNLGVETEIIDERRVKISCLGDVQFDKIRSELEEAGIQVEVTSREFEGVKTG
GRAVGRFGPVEVEVLPRASEGVRVFKRGKDRA TTKEVTTAHLVAEELGLDGLVNI
LSEGESPEALAEIAAAIEEAGIFELYPIENVLIEVDNVGKAASLVYKHGQVIESDE
SSIKAIVPAPRLNELVSDLMTETSGRARIRLLSSAGAGGPILSVDPGEVNFGIAYIPRR
10 GPCDVT SVKLTGHTRDAKVEELRRTLKMFLADREEPNLVYVGNPGHDAVEALG
DVLPEAEIVLVDERETTKEAVYRLSSGKLENVRSRDLRDHGVAAALAIARRGQLGRRV
KKRVDREGVRRAVVTA FG GGSRRFGDYSRLPIRNPEEELEGTMLQVKDPNAITGL
SKGEVVVFHGWREDGGMIASTLTGNRVIIKPRDGRSLKNPRRFFEVRFPVKPKRSS
RRGEG
- 15 <SEQ ID No.:1565;PRT;Methanopyrus kandleri>
VLALFPLAHPFTITSED LRSVWRWIKTPDIVRYTDS ES LAELLKRPLLRAVRSSLRP
PTVSWTGPCPEEDLRRAGAEVEMDEHRPFETSDVLALCTRTFALFLKGVRGGAVG
LVGFGDLDDLHRYLVELGYPRTFKATSTLMLRRREVEMDELWKLFPWAGDDVEP
20 LLRETLKPDVVEDLLEEARSLTSSLGPRVRDLESTPTGRLLASSQTVWVVKGALNE
- <SEQ ID No.:1566;PRT;Methanopyrus kandleri>
VILGEYVLRDLFPDLDEDQYQPA GIDLKLD R VFRL EGRGALLEGDDKRLPEYREVET
EGGVFELEPNVPYVLELAPELEIPEDTAVLFLPRSTLLRSGVSVHTALGDPGFRGKIR
25 VLAVNHHAAPYRIAHGERVVQAVFLRAEDAGRYEGDYGR
- <SEQ ID No.:1567;PRT;Methanopyrus kandleri>
MTVVVVVRKGRLVRSASGGVLEADSSSTLILTEEMNLLVDTGGEDPKGLIRDLEPYG
VDAVVFTHGHQDHVGNARAIAETFHPEFYAHEREAGSIPVDVDPVDSFDPPEGVEV
30 IETPGHTPGHISVVVEDRIVIAGDACPTPDNALERVPPAISWDRELAEE SLRKVLSYP
VVI PGHGIHLKR
- <SEQ ID No.:1568;PRT;Methanopyrus kandleri>
VSVVNLREEARKLEEELSGLLGRPVVPVVEVFVRRRCGCRGIVLYVKGLTDDIEVL
35 GELSDALSRLGDGCPVAELRRIGPEVRSLMLLEACDEHPPDEDPSLLPLR
- <SEQ ID No.:1569;PRT;Methanopyrus kandleri>
VSVVHWSLYVNSAVISAAAALVLPNPVYVYRHGGDEFTASLVLSTFSITMTITSLAS
TSLLEGVRAGLPICLGCLGYGWALLPFFVHDSVASLAFARALQGVCSGFSFPANVA
40 AALQLGRSAVSKNNFW SNVGFIVGYLASSHVRDPFGICSVLSALAAVFGPLLT LRI
QSQEDVSAYHGYPVAFGAALALT LASTLPNSAITLLAPKYGGDYGLVIAMMTAVGGV
AQLLGPRLGELESTLLAVVLCVVSAA LGYSLASVLAAGTATGLMYAANVYSGGGR
GVRAVSTAIGVGYAVNQ TIVGAILSAGLDGWR FATLMAAAITLV SLLGVRR
- 45 <SEQ ID No.:1570;PRT;Methanopyrus kandleri>
LSGVEERLQEVRRGALIGIYGNILLSVLKIAIGHIASSWALVSDGVHSLGDTVSSVMVL
LGAKVARKPPDARHMYGHYKAEALAGLVSM MVFTGLLLLWESLMRLRNPEPPT
STLPLVALGTVAAKEGMYRYTLRLAERVGSSALKADAKHHRSDALSSVAASVGIA
GALLGYPWADPGAALVVS LMAHMGLELCWESVHELMDVAPEDELLERVHEIVENT
50 LQDVDFDVELIAVRGRKMGPAYHFDVFVAADPEARLRELDTVRKRIVEGIRREISAA
ELVTVEFVPM

- 5 <SEQ ID No.:1571;PRT;Methanopyrus kandleri>
 MKVTGDVPGDIVVNIRVVDTFIHGKIKLWCYYDGLKTRNIETFGSVVISDDGDWTI
 INLEDRIILLYDSNGIFEIKLENEYINVRWDVIKRWGSRKVRVNDFFEDIVPNK
 YRLAIVGMMIEQLPGNNKKILYSILKDLASIKCEVTENGCSVVAESDGTPLKLGDIEN
 PIKGIEANIDEEGRIIVSASDKPVYKPLYTGMETVTLRVSPIPVEVKVNGENVPIIGLPV
 ISDLSGTLQVAITKDTILAGFIDGEGA FRWLGVYKE
- 10 <SEQ ID No.:1572;PRT;Methanopyrus kandleri>
 MNVSTTLIFTTISP GTSPVTFIRTL PFTSNLLFLT SISIVSLFENLNAKV FVVTLS PSGSL
 ILSTRTL YFKCFELILANGTLVPKPLT ISSI IKCSDFILFIFKSNPISILTSYSPSEAVKAIL
 SFLLSYVSVVSD LAFINTLFSVGTILIVSPMFNLLKIKRSFSFRLRLATLIRT MFAEV
- 15 <SEQ ID No.:1573;PRT;Methanopyrus kandleri>
 MLAVAIAGVRSGCGKTSLSIGLVRALREEGTRVRP FKVGP DYIDPTYLEVAAGLEAF
 NLDWMMMGESGVVDAFGRYTRRCDAAVIEGVMGMFDGHGEGTVEGSTAHVAALL
 GVPVVLVDCRSYATTVA AEVRGFRDMAHEIGTRLEGVILNRVGSERHERLLITALR
 RYCPDVRVFGVIPRLEDAVIPDRHLGLIPADERNEFAERVAEYWG EVVAEHVDLDAL
 RELEV EGSPVEPSPPPEPERVETKVAVISGRVFTFYRENLRFLAESAEVVPVDPEK
 DRLPDVDAVYIPGGYPEVYADNLDRLMRDLLEFHEEGGRILGECGGLMYLCSEV
 20 DADGDRHDMVG VFD A VARMRERLAALGYVEGRVTD AHPFAPSGSEIRGHEFHYSV
 VDVREDLEYAYRLSRGTGVREGLDGLVKGNTVASYTHLHRS DGGVFRGLVQ
- 25 <SEQ ID No.:1574;PRT;Methanopyrus kandleri>
 MVEITIVVDNRVGMVRDPYVARHGLAIIVETDSSLIFDTGPSANTLANNRLAGFDA
 SFDHVVISH EHW DHTGGLEAVEGT VHRPGGGEETLDDDVVTRTFEGEYEGRPMP
 EQALIVGDVALIGCCHFDLEELLGEYEPKTVIGGLHLMGAPEEEELERTAE LFREYGV
 REVYACHCTGLSESAYLAKVVGGE PAYVPMRMRF
- 30 <SEQ ID No.:1575;PRT;Methanopyrus kandleri>
 MEERGHSLKAALRNALRGIGRRHRFVQALAH ELVRVLGNVDLVLNRVLRGSTVED
 LHPYL RNALRVGTWEIHWRR EHPGPVT KAVVDVVKERVGPKHARFANAILRQVER
 VNPEEVISSIRDPTARFAARYNFPKWYVELVRS AFDSMDEL RKFLEACNRRPARYV
 RVNTLVSDPEEVVRLKRRGIEAERDPDVPDLRIRSAETPVIKTPEFKKGEVYPQT
 KASAAVAHAAEPEPGMTVVDLCAAPGGKTTHLAQLMEGRGEIIAIDMHPKRFGTLK
 35 KRVRQFHADDIVETLCMDARDAPDQLGEGIADLVLDPPCTGTG SVYSKPEKRWD
 RETTGEPTKWAQLQWELLKVAVRLLKPGGRIVYSTCSITLTENERLIERLVRRYRGL
 ELVDVPLEWASPGVRMPEARRIWPHRHDTDGFFVARVEA
- 40 <SEQ ID No.:1576;PRT;Methanopyrus kandleri>
 MEKVGLRREL TMLGFISTICCTVIGGGVNVLT CMIQVKAPGVGPYVPLAFLIGAVPSL
 VAGIVAGALSAAVPRAGGHYTYVSRLFD PFLAFFSSWSRFVGEIGAFVAIAIGDVALL
 AAMCKFWGAPAGKWLNAHTLEVATLIIFTWLVNVLGIRIYEAVVDVMFFILLTGFFI
 VVGYGFAHSPA EYLKAIGGTTALKSLISQAGGLPKDVGTL SAIFSAAATLVFAYVGFE
 TGTQAAGEVKKPEKTVFRGMLIALGIITAYYLLYSAAVYHAPWEYIYAKAALADKAG
 45 SNFTVPEAMAPIMPSALAGYVAFVAAIALLSDLPPMFLSTSRMTFAWAYDGMF PKVF
 AKVHKSFGTPHWALT VLMVSVILT WAVGKFLAAVDITT VALLFTYLFICMTGLVWKF
 VRPDIYEKAPLGDKTKKAVNWL GATGTVLSLFFLGEIAISDPTS FYWWIALMVGPFI
 FYYAYNRTVKKLGPEKARERLMTIPPE
- 50 <SEQ ID No.:1577;PRT;Methanopyrus kandleri>
 MTYGISKHLEISGEYRDKLLRGEKRATIRVGRVPGARPGKVVIHCGGYVYGKVRIT
 NVRTKRVRDLTDEDANLDGFENREELLKALRDHYPNLRDDDIVTII FEWVERFDEPI

LSEHLPYEGHDPPIEIAKRALEEDIPLSPRDRELLELLVECGSIRKAAKALGGLGKRDDVI
 RRAVRKAFRLLKSRGALKGRR

5 <SEQ ID No.:1578;PRT;Methanopyrus kandleri>
 MSENDLLVPLNDYLAAGVHIGTQQKTKDMEPFYRTRADGLHVIDVRKTDERIRIAA
 NFLSMYNTDEILVVSRRYYGQKPVSKFAEATGTTAIPGRFVPGTLTNPEYDGYLEPE
 VIVLTDPRADFQALVEAQSIVGIPALCDTDNFTGNVDLAIPTNNKGRKALALVYWLL
 ARELLKKLGRLEEDEEFYDPEDFEGPPPR

10 <SEQ ID No.:1579;PRT;Methanopyrus kandleri>
 VPKVVIDYDACVGVSECGECIEACPMVDLDEEDDKPVVNNEDDCTGCGLCEQACP
 HGAIEVEV

15 <SEQ ID No.:1580;PRT;Methanopyrus kandleri>
 MEDLTRFEIARIVGARALQIAMGSPVLVEVEGEDPLEIAKREFDEGVVPVVIRR

20 <SEQ ID No.:1581;PRT;Methanopyrus kandleri>
 VSGNPSGALQRVNDLELDPIGLLKDAVATPSVTGEEHEMTRLLTEVLDEHGVPEV
 DEMGNVLAGDLSGLVLNAHLDTVPPGDGWEVTDPFDPTRNGKLYGRGAADCKGG
 LAAATAAVVQGYEEMPMGLLATVGEESSEEDNGTLHVCRTRELEARAGIVCEPT
 DGRVHVGDGRITLRVTVRGRSAHASTPEMGKNPIEAASRVVEALSKLRPTEYRLP
 EIGTVRSDLTVTRIEADGPSNVIPERCMTVDYRTVPGESTKEVKRRVERVAKRAVP
 SGFEVSVGIESASRATVVNVEAPVVKAIVIAARKVGLPGKLDKFRGHCDIEYLVHEA
 GLDAVILGPSGGNIHGPDEWVKVEDVVR CARAYLACANLLPTPH

25 <SEQ ID No.:1582;PRT;Methanopyrus kandleri>
 VKPLEHPEVTRAVMVPFTKVAAGILRFADIEIVGICDYREEKVGKTTKELVGDDVPEL
 EIRPMEDLEELLEAEWLITKEVLDEEDVHYLKWREAVDEAVVKGVNVNMGRLH
 MVAQDPNWKLEAHKRGVQYFDTSDPELYLEYLHYGMKAREEGVNADVSVIGTGR
 30 RTGKFTTLNTARRILEEEGINVRSVGTEPSSLLTGSEAMVIPQVLPMAHAAGTVYGA
 VKKLDEEYEPDLILVGAQTGVADPLEVGTGRGGSALAALTILLGSDPDRMVVATRPE
 LLNGLQDVVEVTLTGARVQFVSVNGKDYSEEEVREVCERIEDEFGLPAADPIKME
 EEFRLVLDLIAPG

35 <SEQ ID No.:1583;PRT;Methanopyrus kandleri>
 VKGEETKQLARKVAEEYGVLLTPEALRELEDEDDAPEVLEKSDEVLDLPVFTAQLIRG
 EVDPDFLEGMEGDVYEILEAESEEEHEARPRARPSKLPPAAEVDAEVEILEEARS
 VSANGSVEGFVAHFRDRLEKLRPLVKAKLDGEWVKDIGELVERARREPGNYCVAG
 VVTGLRETERAFLLDLEDEAGKVRVVISKPKAPKISEKVRRDVAPGMVIGVKGFVKV
 40 ERGPVMFVGDYGEVTLPGEGDHKSVPVAVEDDVKAVFIGDVHIGSKKFREDLFR
 RFLEWLNDPNPNDPVASRVKYVIVTGDVVDGIGIYPGQREELEIADIDEQYQRFAYLEL
 LPDWVEVIVIPGNHDALRQALPQPSLSSSDPAQPLTELDGVHLPSNPALVRIHGELD
 VLLFHGQSLDDIIDHPDAEHNPDGVRKAVKLCLRARHLVPIYGGSVPIAPLPEDYLAI
 RKLPVHLAVGHTHVSAVEVWNGCNVISTATFQEQTQFQKKVGISPTVGRVIVLNMR
 45 RDEYENPKRRFTIVDLTG

50 <SEQ ID No.:1584;PRT;Methanopyrus kandleri>
 LRPVWTVRIAAAAILVAMTASGFLFAVSLTGKSPVDPQLVMRMSSDLARGDYDAF
 NRDFAMAYLQLTSRLHEGLQTLLEYLGIAKFIKEEVKKKLFYRVRVNVSEDVCTK
 LTELAVDDIAKGKLMVYADTKSEPNKGTKVLIKAIGYVEKV KIKGETIIISTPYIEAE
 GMGIYNGDKEVIIDVNTIKLRQVRRL

<SEQ ID No.:1585;PRT;Methanopyrus kandleri>

MKVPSSSLAGLRRTVAELCKEVHRAGLTIGGSGNVSVRSGRYVAVSPSGFRLSDV
RPRHVPDIVDVEGREVLGTTKPTSELLMHLSTLYREVGDGVVIHTHSPYLTALVHSGNR
PPETEDLRRSVGEIVWVEYQPPGSERLAEAVAKVARKPMVAALERHGGGLVADRP
5 EAALRLAEALEEAARLAVLRPHP

<SEQ ID No.:1586;PRT;Methanopyrus kandleri>

MRNGPPKPPFRKIFFKVSEARQQSSSEGGGDLSDYEEKFEQCCTLLEQRRIQDDQIP
10 RNVRRAAKQAIEALKEEGQSPGVRASTAISTLEEVVNDQNTPEYARTVLLQVIATLE
QVKDEV

<SEQ ID No.:1587;PRT;Methanopyrus kandleri>

LKKIFRNGGFGGPFLMRSGINRDVIEVLMDVYGLTERQATVSVMRSEGMSYREIAE
15 ELGITVSGVRNHLEQARMKMKVDNDFQIARIIGKLEMSLGPALVIAIVPDKSEVIN
RLIQEGEGVTEMTGRGGYTGEQSVLFIITEDEKKVREIIIEEVGREVPMFVMRAPA
AFPSP

<SEQ ID No.:1588;PRT;Methanopyrus kandleri>

LRGNPDIKRSDLNKAERLLAGHKMLGIHCPECKVPLFQDPKTGTVSCPICGTEFEV
20 VEEEAKKVKRKAKERRKRAESEEKTKWAEKKPESGKKERKPEKEKQRRPRLPG
SEDEVKAALQVVTARLKRAAETKDPEHALRELEVAEKALEILKKL

<SEQ ID No.:1589;PRT;Methanopyrus kandleri>

LPRKHSRSSKSKCLVFGVWNRQFSELAIELEFEVGAVQFYDPDDQPGDVISYVRE
25 GPGRLLPRFRPPDDQWLIRALEELQPDVIVPTSEFAVEAAFRTSKKLGAEYAGNEPE
VNVAAADKLELFNRLSDVLPMPETSEDPSELGVETLVEKPVRGAGGLGVRKVKLDE
ADPRPGVIFQEFVPGRHVSFTFVSDGSDVRVLSVNDQLIDLRSEYSYKGNLVPSPY
HLVPSVREEARRVCEVLVDELGLVGLNGVDAVLNKGHLHVEVNPRPTAVTECLAR
VSGDNPIRLHLQAFDGLPERWKIRGWSCKRVVYAPNTVRVPYLSWTRDRPRPGT
30 VIPRGEPVCSVIASSSTPSGARSMARLERVVVNRLEVRVSSSTPPTEGWY

<SEQ ID No.:1590;PRT;Methanopyrus kandleri>

LSDELHGIGHEVVLVDIYGTCDARPYPILRRAFGRFDFIAVPVHCGVDFGTVEGPR
35 VTHHALAGALAARYKQDFLFEVTGVRGKTTTATYLAWILEEAGHRPALSTTDESPV
GRPSVTPARVVEVVRETSGPYVCEVSLGVTSAADYAVFTGAPYDYPIAGGSSSALR
AKKKTLLSEGAEVMIEYREAVKLSLVGPKVHRVHTSDGTVKCDDICVEFEAFDIPFH
DRCFGLAAATALTSGLADREDVEAARARGPVPSRLELRRNELVDAHSVNEQTVR
YALSVASDLWGRYGAVIGGTLGGYCEGVDPEAVAIEVLQERIERGELVALKLKGELG
40 REVERHLENVDLPEPGPDTPIVRIVRKG

<SEQ ID No.:1591;PRT;Methanopyrus kandleri>

LAEVQREFVMIKPDGVVRGLVGEVIRRLERKGLKIVALEMRQLDRETAEKLYEEHRD
45 KPFFEDLIEYVTSGPVVVMIVEGRKAVKVVNRNIIGATDPAEAAPGTVRGDFALDIGN
VHASDSPESAEREIEIVFGKDLSTIDYERCDEEWLYES

<SEQ ID No.:1592;PRT;Methanopyrus kandleri>

LGVKRGGTLSDDGFEGLTEEAVEFLEDLEGTAVRLYVHNDADGLTAGALMAFTLRC
50 LEVPTRLRLVNTETELLKEDLDGPTVVDMGSGILDKLRNDHPVLVIDHHEISSKPSD
NVLLVNPREGVDGGTEASASTVAYLLCRRVVKVEETCLPKAALVGAYGDNQAGK
RGVRGLNRVPEEDGEKHEIIEIRDPAYWVFGASMTVGEIVERVSGASVREALEAR
FGDLDPAPVDLSREDEAEIVREHRELLSGEKRKELESKTGRIHVDFEERPLKALRDP
LETATLLNACGRYGEGWAGVLIAMGSWDPLQLAKKLRSKHKAIIREALSRLSRGEGI

TDRESMVVIDGRELGIPTVVGIVAQFVCEERERVTVGVAEMEEGLVKVSIRCPENS
DVDAAEVIKEAADRVGDGEGGHERAAGAEPEDRLEEFLLLELEKLL

<SEQ ID No.:1593;PRT;Methanopyrus kandleri>

5 LARMHSRDRGKSGSTRPPRVAPPSWVEYSPEEVESLVVDLAKQGYEPAMIGIKLR
DEYGIPDVKLITGKKITEILEEHGLAPELPEDLLNLIRRAKRVREHLKRHPKDLHSKRG
LQLIESKIHRLVKYYKRKGVLPEDWKYDPEALHVE

<SEQ ID No.:1594;PRT;Methanopyrus kandleri>

10 MKVLFATGNIGKYHEAKQILARYGIEVERVDLDYPELQSDSLEEIAAYGARYCAESL
GQPVIVEDSGLFIEALNGFPGPYSAVFDITGNEGILKLEGEENRKAEFISVVGyce
PGGRPVTFTGEIRGRIAEPRGEEGFGYDPIFIPEGEDSTFAELGVEEKCKISHRTKA
LERFAEWYKNNVAGR

<SEQ ID No.:1595;PRT;Methanopyrus kandleri>

15 LSESNKAIRQPIISVLGHVDHGKTTLLDKIRGTAVAAKEAGGITQHIGASEIPLEVVKEL
CGPLLEQLDVEITIPGLLFIDTPGHEAFTNLRRRGALADIALVIDIMEGVMPQTEEL
RILRRYRTPFVVAANKVDRVPGWKSHEDTPFLESFQKQSPEVQQRLEEKVYELIGQ
LHQHGFQAERFDRVRDFTRTVAIVPTSGVTGEGIPPELLMVTGLAQRFLLEQLKIEV
20 EGP GKAAILEVKEEPGLGHTVDAILYDGIIRTGDTIVIGHPEEPIVTRVRSLLKPKPLDE
MRDPSDRFRKVDEVTAAAGVKISAPELEEAVAGAPLRVGEDEDVEEVVREVQEE
VEEVTIETDQEGIIKADTLGTLEAVVGEFKEKDVPIRKADVGDITKKDVIEAHAVA
DPLLGVIVGFNVGVTEEARELADEYDVIDIIDDVIYELVEKYEEMVEKRIERERRKRLD
ELVRPGKIKVLPGYIFRQSKPAIVGVQVLAVIKPGYPLMREDGRELGEIKQIQMHGE
25 PIKEAKKGQEVASIEGPIVGRHFEEGDILYDVPSEHAKLMFEEFKDLLTEDELEALK
EIAEIKRKEDPFYGM

<SEQ ID No.:1596;PRT;Methanopyrus kandleri>

30 LIAVLLVLLALPTSGCCEAVWTVYDWGSKGNILKNPVLVQHAPHGPRSEVVYRHSV
EGTVVFEFRGGPGPAVLLTAGVHGDEWTVIALKLLDALSPSTSVIGTVYVIPAVNPA
GLAANSRLVDGVDPNRTADIPGSLTWHLVRFALSHRVKYWLDMHCGSGVPRQGA
LTDEESEFVDELARSSGFVPLVKSAPRGSIRSVARRFGIDVITLEVPRDAGPSGVER
AYHAALAFRLTGALRRGQSRTPASGSANVTVPVLPVPAIVPRRLG

<SEQ ID No.:1597;PRT;Methanopyrus kandleri>

35 LYKQVIVVRGDLKLSRGKLAQVAHASLGAFLRAKESGAPVEEWLREGQKKVVLKC
KDKEELLEHELAKRRGLPSFLVRDAGLTELEPGTVTCLGIGPEREEEEIDRVTDGLPL
LR

<SEQ ID No.:1598;PRT;Methanopyrus kandleri>

40 MSKPMYVKFEVPEELAEKAYEALDIARDTGRIRKGTNETTKAVEREEAVLVLIAEDV
DPEEVVAHLPELCDEKGIPYVYVPSKDELGAAAGIDVAAASACIIDPGDAKDLVDEIIE
KVEELRE

<SEQ ID No.:1599;PRT;Methanopyrus kandleri>

45 LKVLALLVLAWLAYAFLGFVKFYATTGCLPLGR LAFVKLHDPDIRPGLHEMVATNV
AHTLGYSAVTIVHNAGNERMYGSWTEKNGVLVWNIAALDPRGNRASVDWHGALRE
LVFADRLRTATWVHDGPIGGPRFPKNSVIFWHGTVRNGFPLLYGGCGCEPYYYILA
NYGNVPFAITATVLGWFTPLISPLEAFWELSHYKRLQYEYLLKKVNGIRLINLKNYEG
50 TSATPTDSISGNSVPRP

<SEQ ID No.:1600;PRT;Methanopyrus kandleri>

- LVGRYTRKLEDAELALTFDDVLLPERSSVEPADVDVSTRVTVNYRINIPILSAAMDT
 VTEAEMAAMARHGGLGVIHRNMTVEEQVKEVRRVKEARDVVQRDVVTISPDESVK
 RAVELMEKHDVGGPLPVVDEEGKVVGITRRDVGLLSEEEIGELDVKSVMTEEPVVE
 EGEDLEERALRVMREEKIERVPVVDDEGRLLGIVTAKDVTTELRETEAATDEERRYL
 5 AAAAVGPKDPDRAIALDEAGADILVVDCAHAHTETVINFVKEIKREVDADIAGNIATA
 EAAEDLIAAGADALKVGIGPGSICTTRIVAGVGVPGITAVAWVADVAEEHDIPVIADG
 GIRYSGDIAKAIAGADAVMLGNLLAGTDEAPGRVIRLRGRLYKQYRGMGSLGAMM
 KGESADRYFKQPEQGGRHVAQTKFVPEGVEGVVPYKGPVSEVLYTLVGGLRSSM
 GYVGAKNIEEMKKKARFVRITRAGYEESHPHDIAITDEAPNYPISNQ
- 10 <SEQ ID No.:1601;PRT;Methanopyrus kandleri>
 LGELADAVREHLVSATLNAIGLIVLVIQLVVPPLASLGTMIPIGIGVPVNMVLTAVGV
 VLALYFAYGVLKHVKPMITPAADLVSMVLLGRREEDLRTATYNLVLAIVLVAVLLS
 PLMVSVPAGAVLSLLVLLVGIGFGGLLLIKAATGFYEVFRDKLEELAENLAERVEEL
 15 ERKASETEETESEE
- 20 <SEQ ID No.:1602;PRT;Methanopyrus kandleri>
 MRPRLLVSPVNRDEALEAVEGGAHIIDVKNPEEGSLGANFPWVIREIMEVVPEDREV
 SATVGDVPYKPGTVAQAVLGVAAGVVDYAKVGLYGTKEEEALEVMRACSRVRE
 FGYDTRVVAAGYADAHVGSGLDPMSPVEVAAEAECVAMVDTAVKDGKRLFDLS
 EEEVGEFVDSAHEHGLEVALAGSLRHEDMPIVRDLGADIVGVRGAACERGDRNRG
 AIRSHLVRKLAELA
- 25 <SEQ ID No.:1603;PRT;Methanopyrus kandleri>
 VRSLSVLITALTIPLGVAGQIMTPEEVSELPYNHPVIVDVVAGPPEADSIEAYTRIVWM
 DPITHERHIEEEVEVRTSNTLLNWWWASPHRPATCTLMVSFDDRVLERTVRLQAN
 GIVQESLELDVTSGRHTLSVEVTDGGTEDIVSCNLRVEPSENGGENNQVHPFQGL
 VLWPRRRRRRW
- 30 <SEQ ID No.:1604;PRT;Methanopyrus kandleri>
 MASSSKETMVIIAEKPSLAGTIAGFLRGSWDGRKLLGFGRYRGRRFAITSLSGHVLE
 WWPKDDPGFRHPDYFPDPGDFELRPIDGKERFLRAVERVVKRYAGCRADRVIVAT
 DNDAEGELIGWEVLVWLKRQGGGLDDPECARRMRFSAYTREDVLRLEGALRGERI
 DPSLAYSALARTIADWLYGIPLTRRLSLCNDDIVSVGRVQTPTLKLVERERERRKA
 35 QKKRRYYWILQAETPIGELRTEEFKDGRRARELASEIESIRVVEVRRERRSVRPT
 PFNLTTLQRAAGKILRISPKRTLDAQRLYEEGMITYPRTATNRYPTSTFDHEELLRL
 RNAHPDALRDFQRTGRRSEPVSGKEYDGAHPITPTGRRKYIRGKLAWRLYDLVR
 RYLATLSEDALVVKWRIVAEHPGTGTRFVMEGTEVERDGWYSVYPWEKPRESTMP
 DVSEGDEL PANVNASRRRKPLPRYSQSRLVAKMKKLGLGTESTRAEIVKKLFDRG
 40 YVKRAGSGVAPTKRGERLVELLEDVPELVSVELTRIEREMEEISELPPKRARERL
 ERVAREIRETVRRNSKKLKSACVV
- 45 <SEQ ID No.:1605;PRT;Methanopyrus kandleri>
 MTSTEKARIRRMVWEELEESGEAAPPFPVEGRIPNFKGALVAARRLTSTPEYEEAE
 VVKVNPDSQPVRERARLDGKILIMPTPRLKRGFLVKNPKDPRRASTIRGAFQE
 GELTMPDELPAVDLVVAGSVAVAPD GARVGKGGGYFDLEWGILAQLDLVDEDTPIH
 TTVHDIQVLPPGEIPMEEHDVPVDVIHTPTGTTECVRRYEKPGGLLEDRIKIREIR
 WLREYVSAGST
- 50 <SEQ ID No.:1606;PRT;Methanopyrus kandleri>
 LDARELIDKYHMNTYSRFPVTLVPGEGARVWDDEGNEYIDLVAGIAVNVLGHCHPA
 VVEAVKEQVERLIHCSNLYYNEPQAEAAARLLAEAPKDLNKVFFCNSGTESVECAIK

- 5 LARKFTGCTKFIAFEGGFHGRMGALSATWKPEFREPFELVPEFEHVPYGDVNAV
EKAIDDDTAIVVQGEAGVRIPPEGFLRELRELCDEHGLLLIVDEVQSGMGRTG
QFFAFEHEDVLPDIVCLAKGLGGGVPGVATIAREEVAEAFEPGDHGSTFGGNPLAC
AAVCAAVSTVLEENLPEAAERKGKGLAMRILSEAEDVVEEVRGRGLMMGVEVGDD
RAKDVAREMLDRGALVNVTSQDVIRLVPLVIGEDELEKALAEALADALRASG
- 10 <SEQ ID No.:1607;PRT;Methanopyrus kandleri>
LGFQIEGVIPALITPFTDDLKGINEEGLRENVSRLEAGVHGVVPAGTTGESSTLSHA
EHRRVIEIVVDEVNGKVPVIAGAGSNSTREALELSTYAEDVGADAILSVVPYNNKPP
QEGFLFIHFSKIAEAVECPILYNVPSRTGCALEPETAACKLAEEYSHIVGVKEASGDLV
VQRFIEETPDDFILLSGVDELTLPIAVGGVGVISVTANVAPELMVEMYEAWKSGDV
ERARELHYELLPLHRALFTETNPIPVAAVELVGMASPPRPPLKEAREDTKELLRR
ELKKLGLLPEGG
- 15 <SEQ ID No.:1608;PRT;Methanopyrus kandleri>
MGKVRPTFVKRPAREIVEKYEYLTDFEHNKKVVEIVARPKTKKLRNMIAGYVTHL
MRLKERQREEGTE
- 20 <SEQ ID No.:1609;PRT;Methanopyrus kandleri>
LNVLEELRREIDRIDECLLDVIERLKVAREIGRVKAQEGPLTDEEREKELRERWRK
RFKTEGLDPALADIVLASILKVSKEVQRGVIGDG
- 25 <SEQ ID No.:1610;PRT;Methanopyrus kandleri>
LGEIAYAGTVVNAISAKKGCAYALDLTVSVRAELSDSTEIHTDVEDTSLVERCDEV
VGEHVGQELNFEIEVDSEIPIAMGLASSAVSNVVEALLKELGREPEPFVRLGV
EASIRAGVTVTGAYDDACASYLGGVLTLNDQHRVLDIRELPYPYAVILLPGGKVETS
EVDVNRLELLAPAAETAFFRAMTG DYRGAMLINSVYCSALGHEFEPVVEALEAGA
AAAGLSGTGPAFVALCETKSDVREVSEVWSDRGEVLETRTVGPERARGAQARNRP
HR
- 30 <SEQ ID No.:1611;PRT;Methanopyrus kandleri>
VKKTIESLGDIGDVLAEKKNTVELRIVECPFSQDVKRELLKRDKVPVVCPPASLVLKA
TEETFGVRMRTASIDIDEEECRFVMERLE
- 35 <SEQ ID No.:1612;PRT;Methanopyrus kandleri>
VIGFADRLAEITKKIKGASIIDEDFVKEVVRDVQRALLEADVVDVKLVLELSKRIEKRALE
EPPAGVPKRDYLLRIVYEELVELLGGEKTEGLDIDLSRDVNVIMLVGLYGMGKTTT
AAKLARYLQKRGYRVGLVGADPYRPAAGEQLRQLAEEDVPVHVVEDVDDAVEMAV
KGVEALKDECDVVIVDTAGRDRLSEDLIDELREMAERIEPHEVLLVLDATVGQKAGD
40 HAEAFHEAVQLTG VVITKLDTAAGGGGALSARTGAPIKFVGTGERVDDLEEFNPR
SFVARLLGIGDIDELLRRTEEMLEEEKAEDVLEGEFTLKDLYEQLEALS KMGPVVK
LLQYVPGMGGRNVRKISQITEERLKKYKVMDSMTEKELENPEILNKSRIIRRIAIGS
GTSERDVIELLNHYRMMKDVIEDIQSGRIPRIGGELGRVIRNVLRG
- 45 <SEQ ID No.:1613;PRT;Methanopyrus kandleri>
VPSSLFGKMSVLSKVKEKVAKRVEERAEAEAEAKVKEVETMPEDLKKPTLKERLK
RVVKREVTITEADIEDILDELELELISNDVAVEVAESIREELKKELVGRRVKGKSEIPKV
VEEGFREALLSVLEPKKEVDLMETVEKARQDGRPAIIMFVGVNGSGKTTTIAKVAKL
LKD HGYSVWIAAADTFRAAAIEQLEEHAERLGVTLIKGERGDDPTAVAFNAVQHAEA
50 KGKDVVLVDTAGRAYTDVNLMEELKKMKRVLEPDLVVFVGDALAGNDAIEQAKTFH
EYVGIDCAILTKVDADAKGGAVLSISKVTGAPILYLGVGQDYDDLKAFSPEWFFVERVI
GGEES

5 <SEQ ID No.:1614;PRT;Methanopyrus kandleri>
MAEKKNEQEIQQELQRLIAEINRLQGQMEAINAQIDLISSISELNRVEETLKGVKELE
GDEEVLVPVGAQSFVRACVTDTERVIVGIGAGVAVERTIDEALESIDDRQRELEKAR
AEAQQKLQELAQELQEKQRKAQELAQQLEGAQRIAQQSGGG

10 <SEQ ID No.:1615;PRT;Methanopyrus kandleri>
MSEVKVFEVRGTFRMGDEPRQPFTRQVPATSEEEALEKVYSDLGSEHGVSRMEIQI
EEIREIDPSKVEDPILRLLGVEE

15 <SEQ ID No.:1616;PRT;Methanopyrus kandleri>
MTVVKASVHGDPNIGAWIAASEEYAVVAPKVPDDIVERVKEALDVEVVRTTVAGSNL
VGALLAVNSNGALFPRHAREHEIRVVRELGVEVDVLP SKMNAVGNLVL TNDHGALV
HPDLDDHALEVIESVLGGRVVRGELGGVKT VGSAGVANSKGAVVHPGATEEEMER
VSEVLGVDVEVGT VNRGSPYVGVGVVNSKGAVVGEDTTGP ELARLEDALYLI

20 <SEQ ID No.:1617;PRT;Methanopyrus kandleri>
VAEVD DERVYTVPLRDAKKAPLKKRAPRAVKALRQFIERHMKAE EVRIGNDVNEKI
WERGIKKPPSKIRVRAVKYADGTVEVRLAE

25 <SEQ ID No.:1618;PRT;Methanopyrus kandleri>
LARVKPLGKKLRMAKAIKQNRVRPPWVVAKTGGRVIDNPKRRHWRRSKLKP

30 <SEQ ID No.:1619;PRT;Methanopyrus kandleri>
MTDPELERIRRKIMELQRKLEESQEKKVEEEREKKALEEAQRRAMLRRILTPEARE
RLARVRLARPQLAQAVENYLLQLAQTGQLKEKIDEDQLKRILKQVSDATRKEYRIRF
KRK

35 <SEQ ID No.:1620;PRT;Methanopyrus kandleri>
VYDAYVVP GSELVERLAEKLD FEEIKPPEWAKYVKTGRHKERPPEDPDWWYMRA
ASILRRVYMDGPVGVSR LRTYYGGRQDRGARPERFRK GSGAIIRKILQQL EEAGLV
EKTEEGRVVTPEGRSLVDSTAHEIAKEKGYTDKFTSPI

40 <SEQ ID No.:1621;PRT;Methanopyrus kandleri>
VTQVKRLSGKERRALRARAVLLDPVVRIGKKGLTSGV IQEVDRQLEERGLIKVRFER
NILRRYDRKELAEELARKVNAELIDVRGRTAVLFRPREGWRRFHGLSR

45 <SEQ ID No.:1622;PRT;Methanopyrus kandleri>
VCKVESPRSGVLLLRRIALERAERLLRLARTVYYEDPD RARRYVELARRIAMKARVK
LPKHLKRSFCKRCNTPLIPGVTARVRLRQNRMPHVSVTCLECGYIYRYPYLREVKE
RRRRHMEGVKDRDAG

50 <SEQ ID No.:1623;PRT;Methanopyrus kandleri>
LRNSNTPERGDSTLHTWLLLWLLLPMTPAQADPTSHYLEVHPDTPVTPTEGSPLVP
AYVELTDEGKEAALSLLERLGIPSDEAAVGYLADVFVGESCHGGTRCLV VYNPQDT
TVEVRPWEEDRLPLRLPPLRLDDHLTELLCLPVREQITLQPAVLELGWNLEMMQR
CTKAVRLHKFGEPTAVIAVYVPTETAALRAFESLLPDPRNVARAMLERLSSEVRDAI
DEYLVRDRLERLVKSRLGSDVYDRVREYFSSMIHLTVSKIEELYDERVLPALIEWCA
AIVRYVETSLITAFALLYPDNPSADVLERRVAVYN SPYFQILRDWLLPEPSYTAWKSVL
CDLAVTVADSIFEAAPVLSALRLDSESSRTTLEEITKSAVKNFIEALGPCLRTVLELL
LLDTLMGLAWAC

<SEQ ID No.:1624;PRT;Methanopyrus kandleri>

LSKDSVRAASTGHTHGAGVGLLRFLQRRVLIVGCGNELFGDDGFGPAVIKEIERRG
WEHPDVEILDAGAGAPQNVFSLIDEDSKVEYMMVVDAVDVGAEPGTLLEFGPEDLD
PNCRIVPVDAGHWSIESALLDLNERIGIDFRILGCQVKELPIPEVQPGLSDPVRKAVP
5 KAADRAIELAERYLGEKTR

<SEQ ID No.:1625;PRT;Methanopyrus kandleri>

VIQGWSALRRGRLNLEAVIRALAAERMASELPLVEVAARLDVDPSTVSHYLSGDYP
SEETRDKVRVVVEETPPFGLWPQLREALGVDVAAEALKWVMGPRTEAEPDVDDE
10 RCLACGRCEICPSPDGECLGCGECVRACPSGARSLSVRYRGLVYRVFSPK

<SEQ ID No.:1626;PRT;Methanopyrus kandleri>

LSLLKLVKGS�TVLVGSLFLRLGGYVYRLLVGRLLGPDGYGIVSSTMVIQTIVMFLAT
FGVPPAVARYVAKYHALGEGTKVRQFIVIPTLVLVALSTLAALILALTAPYLASWYFH
15 NPRLYTPLLIMAIGLPFAAFASCVRGVFQGFQDMRRYVLTQFVEQGTRVGGAPALIL
AGYGPAGAVFASATLAYATSGLYGAAKLRSEYLPKIPREGEPLPSDRVAKDALTFGL
PVALTGADMIQSNVDLLAIGYFLGTLWVGYYDAAGPIARLPTTLCAAVATALLPAAS
EAEALKDERTLRQYAHIAIKTMWTLIPVAVLTGALAEPLITLFFGPAFRPGAQALYVL
PTAMAFIVFRSCASLLQGIGRERLPLVLSFSLVANVVLNAIMVPKWGIFGASVATA
20 ISDWLAMILIVRAVMVHAKHLKRWALVPVIAGVAAWLTTEWSMLFTNGALLKLL
GSAVGTLTYSILLVVLGGVSDLEWELLEKGARRVGSPGIVRVRLARSLDILGRIKP

<SEQ ID No.:1627;PRT;Methanopyrus kandleri>

LSEREQLIYLNELVPREEAKISVYDHGFLYGDGVFEGIRAYDGRIFKLDEHVDRLYD
25 SAKAIMLEIPMTKEKMKEAIIETVRANELRDAYIRVVSRGEGDLGLDPEKCPEPNV
IIAEPMEPLYGDLYEKGIEVITASVRRIPPDALDPKIKSCNYLNNILAKIQANLAGADEAI
MLDHEGYVCEGTGDNVFFVEDGTVYTPPEDTILRGITRATVMEICEELGIPVEEKRT
LGELYAADEVFLTGTAAEVAPVRKVDGRKIGEECPGPITRRIMEAFRELTKKEGTPV
YEE
30

<SEQ ID No.:1628;PRT;Methanopyrus kandleri>

MAERIVREVLREARRRGVSVDLFSSEGWVVNEITDRISRVLGSVGAPSEDVRESIL
EETSSKLKSPPTYLSSIAETVSQVLPWGEEDADALPDHDFSEKVLDDLLEGAEFVC
LASPWVSSPKDLVEEGVRSRLRGLSDRDLELYLLVAAGENEREVLLWASLGFEVRE
35 AEGRREGDLGIHCKVYANEKLALGASWNLTVSSLRRLRAMREVHTINPKADDCEVC
NANYEQLVSEFNSQWSEAKQRFFRDEGLKGPAIFEVRWDGDRPTEVVIYRENGER
WFTVELEDNHEGFVFNEREGLPVRRGVPRVHRFDLRGSRRRGQDRLSLRRTQAR
EDPSGASGCRRAGREMER

<SEQ ID No.:1629;PRT;Methanopyrus kandleri>

VRWKDNAKKYKHQLTGRPYDGALVWGLDPDRSDFYVAGGKLLVIRCEESGGSI
40 TVEFVDAADPGNLPDWVSGSVDLGWLFDRSSGEGTPTLFVYD

<SEQ ID No.:1630;PRT;Methanopyrus kandleri>

MENQLLAVKALVLVETRGMPIPEAVERTCRDRPIDVRRSVQAFVYETIKRRNLLDEL
45 VAAGSDAHPEDVRSPYVRQILRVGTLEMKIWRNPPPAVTDCEMVRIAKRLVGSKAGA
FVNAVLRGVERVSVKDVLEDRPWTERLALKYGHPEWFLVYVLDLFEGRSRVELLL
RANNRVPPQYLRINRLKLDPLVAGDVLEREYGIVTEPTFLEEVRALVRGRGYGSRA
WREGLFDVQDLASASASAALSAEPGETVLDVCAAPGSKTTHTAERMLDEGEVWAV
50 DRSEWGLRVLERRCRRLGITCVRTICRDARGLTVDDLDPDVPDRILVDPPCSTTGWW
NRNPDSRWKPKPLERFAERQWEILEPALRIAEHGGCTLVYSTCSVSWEENEAIKVR

ALEEFDVKLVDAGVLGSPGIEEFRGERFSGYKKVRRYWPF RHDTAGFFVAKMKGK
G

<SEQ ID No.:1631;PRT;Methanopyrus kandleri>

VEVIKVGGEVLDRVEDLARVIDDSILVHGGGPEVSDVMERMGLEPRFVRGLRVTD
ETLQVMMVLAGLVNKRLLVAELRSEGINALGLSGVDGGLLIAEKRESEVVDGEEVDL
GYVGDKRVNAELLESLLDAGYVPVAPLGAGEDGTVYNVNADTAAGAIAGAVRAD
RLVLLTDVPGVLEDLDDPETLIERVPEDEVEELEEKGIVTGGMVPKLEAAKMAVEAG
CREAVITNLEGLLEGRGTIVR

<SEQ ID No.:1632;PRT;Methanopyrus kandleri>

MPRGRDHEPGRVARGEGNHREVA AHLGEKIEKYISKLP SVLNECKPRDRAGERLL
DLASRYFYDARYFLDRGEMVEAFTCLSYAWALLRAGA EVGVLDVPEDEV

<SEQ ID No.:1633;PRT;Methanopyrus kandleri>

LVRPVS VGKHGGVSVEVLHPSDLPPQLTSLCKIKINGARVISRRSNIVAFRGRPSLEP
LNDLDGFMSIAARESEVVMVGDPYLRVLAVEEGERIVVNTDRLLACLD FETIELKND
EITVVECVGPDI VV LACSSPVVASLKLEGDTAHVQAGSILCWWNIHTENVGDFLRLT
GQGHVMLSITKKPDATEKGASTEKTAPRKVSSWI

<SEQ ID No.:1634;PRT;Methanopyrus kandleri>

VRVFRVGGKGITPSPDCNCYLLAVGDEGILIDL GASGEVIDRLPGNV DVRYALLTHS
HFDHAAAGPDALEAGLEVGVHRAEA EVLREGDDRLSAAYLFGRPMPAYEPSFTFR
DGETFDVGGEEVEVLYTPGHSPGSCCFLLGD LAFTGDTVFGFGPGRWDLP GGDR
KKLCESLERLLSTGVR SIFPGHGYE VIGEAVPAIEAALREAEKDI

<SEQ ID No.:1635;PRT;Methanopyrus kandleri>

MRPEELALKAVREALRRTVFDPAWTHVT VVSDDALHVHILTNRKKNVEGKGGRN
RQYLEGYAEGYLA AHGHDVEVRVSVGAGLRDETEEF RYLPLKRALKEGVIEEGSP
IHRVCERLGIGYVVLGAREIVGPNPALVEVVEGLEGERAVDVFTGTGTGALAAVEAG
FEQVY AIDVRVHPEVRERLESEGVEVIEADFRD VDLREFEPIDLLTADPPYASTLEFL
EKLSEERPRVDTAVVCHGFSSWTRAVREIRGFLIELFEDVEPVSKYGHELSVCRRLL
RD

<SEQ ID No.:1636;PRT;Methanopyrus kandleri>

LVRSHAPIPNPVERIRALRVLREVHRRRK KPSLEV TYRTVNGSTCGPYVARWRR
DPRHKHGR TLYLGK PENESVSFVEWL VSLDRREVLELARHLMRNLRSVLKTLTTEV
SDLPYKKARWVLARGLALAFDARPS EPRIRD LLELPDRLESFAVRTLG GWP AHY
SSYL RKVIHHRGKSLDEKHEVPDVGLEFQRWKLQRG

<SEQ ID No.:1637;PRT;Methanopyrus kandleri>

LTSSFYGEPEGLRWLEDDLRLALGLSPVRYEYGDRDAVEVAVHSEGFAALLRGLGM
PEGRKTGRVHVPGLVRRGPDRVALEFLSGLFGADGWISAREN RVEVGIAQASPWG
ESSEFLEGVSSLLKRTTG VYARVLEAGSYETSVDGRRSVFGLGFRGEHVERFLTRV
PFEYSVRKRELGLWAGAYLRYRARGGKDAFERFVEERCLPGGLVLDRV DVERR

<SEQ ID No.:1638;PRT;Methanopyrus kandleri>

LNPELILARLFGVLLGRGTFRDGD RPRVRLSVPIGGASELLADLSRLGVNPSVR CGK
RWTSVESRDGR LIGALIMAGASADPVDGIPNWVFEDPEAARELLSGLYSVRGRVLG
FDGSRPRPVRLRLRARADRELDLLSLALDVCRLLGSLNVDAEVVGLSHVSSGHYRY
ARVEVLIRGRDLRRFLSEVEFRYNPEQSERARRMLRELARRETQLSTKWP ARWG
DVGVS DSGDEGLVLRTELGF EIAGPADMWVSSRNKRRLGDLKPGDRV VLYPVGV

PAADRRGTLADVDAP EGARRFLRDL DLLPLRWEDPALPTLTRVLGYAIGDGHLEP
DVVVLRGAGGTAVARGRSARARPLAGAVRVRG

5 <SEQ ID No.:1639;PRT;Methanopyrus kandleri>
VGCPGLYLTKEEERILDGEEGELKAKLMEVLVKLGDFDAERLVRPASVHVSGVSY
GTIGDAGLRFLRKVAEAGLRVSVPTSVNPGICLDGNLPVDEEFERKQREIMDALES
LGVASVYTCVPYQQGFQPSRGDLLAWGESSAVFVANTYYGARANREGAPATVAAA
VVGRIP EYGMHLDENRVAEYEVVVEFEPRNDFEWSALGYLGEALDGIPVLKLPTV
10 PLSNVKYMGA AAAASGALAMAYIPGITPEEPRMDCPERIEVEREDVFDLVEERFGT
EREGFAFTGCPHRPDGEIPRFDGCAICCPANATLDGYRLRGTCPVVAPIEDVHDVV
FTDSLKA AHYLA SRVEVNVGPL

15 <SEQ ID No.:1640;PRT;Methanopyrus kandleri>
VALEKLADLLDVRNENTRHSYRFALRRLDEFLLRILEDEEPEEWLEKAPDEEILEVA
RELRLNLLVESVRNMELDHENGRCLWYALTKALRAVGRDPLLVLTVKAYGSPASPE
MTEQDAREILELVDLIEEWAKENKDASWWAPFRIIAESGISVMDLVRMRWADVCPG
EPWLEETPD EPRLRVEKPEETIEFPITERGLEALRELA EWAGVDPTEEPERFILMSE
DDEYHTDAQRMDSWRARLT YRWREAQRSVLGESEWRIKDLTRATRILRLPELRR

20 <SEQ ID No.:1641;PRT;Methanopyrus kandleri>
VSELNVVELFHGDLYSIAYRAELDKFLPMIGRARITPAELTLAGLLELGYEVEVTTLEG
KSLPGRRRIELADEVKGVVTGRYVEELDSDRVHHLRLSARCLGA EVKIRYSSDWK
VEIGGYEVDPSKLHKNRALVKLLEFVSTREPSFTDLVVDLGAAPGGWSSFAAQMAE
NVVAVDPARLED RVRELENVHHLRITAHEFVLP EMIGVGFPGEKVTL LSDVYSGNPE
25 DDLYAVLRLLERLENDVWVGFKVAPAEDDVLEWFMEEIEEAGFAVENVNLESASS
NETFVYFRE

30 <SEQ ID No.:1642;PRT;Methanopyrus kandleri>
LKRSPRDSVPYVTLDGSLIYEVVRPEFSRVNTVSLAVAEIPPGESTVPHYHLDFDEV
YVWLEGRGIVHVGSRSLVHPEDCVEIPRGSVHWVENDGSETLRILCVCSPPYRHE
TTVTLGSKRTSRSSSPTRD

35 <SEQ ID No.:1643;PRT;Methanopyrus kandleri>
MIHGNRGALLPIPRIVLAGSSSACGKTMITAGIIQALRADGYEVQPFKVGPDYIDPSY
HWLASGRPCGNLDTFLFREKHVRWLFEHRCEGADLAWVEGV RGLYEGIGAVGV RG
STYHVSEVLNAPVVLIVDARSLTKSVAALVKGYAELEGANIAGVILNRIRSEVHYHKV
RRALVKYTDVKVLGYVPRDRRLKVEYRHLGLVPTPERLEEMRERLRTVAE VISEHV
DLDALIDVAEAAAGPLGPGERPWEVNPTKCRIAVAKDEAFNFYYPENLEALEENGAKL
LEFSPVRDEDVPPDADALYIGGGYPELFARQLEDAESTRNSIRELAESGAPIYAE CG
40 GFMVLCREL RWNEDRYRWVGVDVAVEMTD RVQGLSYTVARAVDDTPVTRKGET
FKGHEFHYSRLVRPEGLESAYRIIRGQGWRGREGFRPKDLPNVLGTYVHVHAASH
PTFATNFTGSTGS

45 <SEQ ID No.:1644;PRT;Methanopyrus kandleri>
LEERDEGDYVVVKCRECGHVIVRRKVGSAGLTTETLGI AVAAAVTATAIASTLV

50 <SEQ ID No.:1645;PRT;Methanopyrus kandleri>
MTVVFAPRFARRAPSRTRGSEAMEFDVVVGAGPAGSVAAWAAAEAGCDVLILER
KAEIGVPKQCAEGISAHGLEHAGIEPQDEWIATEISRALIYAPNGKEFEVPGDGYVLE
RRVFDKWLVR AVEAGAEVELLAHARRALLDEGRVVGVEYEGEDGVHEVRARIVIA
ADGIESRIGRTAGLVP SLKPVEMCTCAQYEMVGVDVEEDATHFFVDAEFFPGGYF
WIFPKGEGRANVGLGIRGSESEPGDALKVLNRALEDHELISEAVADAVPVEVNVGG

VPVCGPVERTYGDGILLVGDAARQVNPLTGGGLHTSLVCGRIAGEVAEEAIEEDDT
SASFLKRYQDRWEEEFGKTFKYALKASKIFSEMSNEELNALAEALDREDILRLVKGE
EVVKVAKKVISRKPSLLKYAKHLMK

5 <SEQ ID No.:1646;PRT;Methanopyrus kandleri>
VIDRLREALKRFNPCDSCGRAFGYGLTGLENRERGRAIKLYLGMRAHLEGEETL
ELLARSGLEEEAAVLDDPPEPEPCGVCRGVLDKVDEFAEVVACELKDLEFRGFVVG
SRWPEEIRKAEKELWETLGVEGEPIKREFNREVGRVEHLLDVRADPRNPDIIEVVF
10 DFRPSLEDPKFEVHVRPIYVRGRYLKLRRGIPQTKWPCPRCRGAGCPNCDFTGKLY
TESVEELIGMVLKDAFLAESHKFHAAGREDIDVRMLGNGRPFVMELLYPKRRNVDL
KEIEGEINRKVGDDVQVVGLEYGDPEDVGKVKDLSESRKRYRAWVKFGKVPED
KLREVLKGLERSVIEQRTPRRVLHRRADKVRKRVEAKLIEYDGDRAVIEFLCDPG
LYVKELISGDAGRTRPSLAELVEVEAEACERLDVIEFLDEGGDRS

15 <SEQ ID No.:1647;PRT;Methanopyrus kandleri>
MPRIVSVKAREVLDSRGEPTVEVEVELEDGTVGRAMVPSGASTGTYEALERDGD
DRYGGKGVRRAVRNVEEIIAPEIEGLDATAQPDIDRTMIELDGTENKSHLGANAILGV
SLAVARAAKSLGIPLYRYLGGPTARRLPVPMNVINGGEHAGNELDFQEHMIVPH
GFESFSEALRAGVETYHVLGELLEEEYGPIATNVGDEGGYAPPMKDTVEPLDVLVE
20 AIEEAGYAPGKEIALALDAAASEFYDEDSGTYRAYGQKYTRDELIDVYKDLVSQYPIV
SIEDPLHEEDFRGFAKITEELGDKVQIVGDDLFTVTPDRLRKGIEMGAANALLKVNQ
IGTLTEAVEAGELALQHGYGVMVSHRSGDTEDPFIADLAVALGCGQIKTGAPARSS
RTAKYNRLRIEEDLAGAAEFGRNDFFLP

25 <SEQ ID No.:1648;PRT;Methanopyrus kandleri>
MTGGKRGWNPASIDPRLYQRTGFLIVATLNLVIVGLVAAVGKIVIVEKHYPMVGAIAI
PIVVAPLLLPLLYLLRVLKREKLVVVGEDRVLIIRGKDVTEVPVDEITGISVDFEFKRRR
RKMIILTRSGHVELPFHSHKRLMRDLQRLLEERRASEVDKETYARAGADRVATVLCK
MVELGRSPVLHEAAGSVKAVWPGDSVELGREDGWAPRWYWFVLCVASLPVKAA
30 KRSLREDPVDTVIAAEEAAKGQSLASSFNKILRTGPIVSALLVFLAVVRGVLYKWGPK
ALGVFLFTAAPWILATSVLSFLLNNRVKTVELHGVRAFFSLVAMVSIFSGLTCLHGS
LAETAMLKRLSPSAHLTAVIELVIAMVSLVPLVKTLRWVDPRGAVRWCMALRATIR
EDRVILFSVVFALLSVFFAGSAASPLWWVTFIATATPVLWTVYFLSWSKMAREVV
SKVWIPESES

35 <SEQ ID No.:1649;PRT;Methanopyrus kandleri>
LCGVSGCYLLKENEAGVYNYLILHANQHRGQESAGICVYDGLRLVGKKGMGLVTEV
FDRPDLRKLSPVGIGHVRYSTTGASELVNAQPFKVGYSKGEALAHNGDIVNSEE
LRRELVS DGHA FVSETDSEVIARLLAVALTETDDMFEAFEDVMERLVGSYSLTVITS
40 HGDIAVRDPWGFRLCLGWDERGFFVSSETVGLDVLGVEERRELERGEVWIRE
GDVESKVVRERKAVCMFEFVYFARPDSEIIEGRCVYECRKCMGKRLAEEAPVECDL
VVPVPDSGRTAALGYAESLGVPMEGLIKNRYVGRTFIMPEQEERVSIRVKLNPIR
EVIKGC SLAVDD SIVRGNTSRQIVEMLRDAGAREVHMRASPPVSPCYYGIDMAT
KEELIAADLDVPEICEKISADSLAYLSLEGLVESIRLKKREL CVGCLTGEYPTPVE

45 <SEQ ID No.:1650;PRT;Methanopyrus kandleri>
VNRAREELDRYRETLEEVSSRFVDVATKARQRREDPKPEPEVMLATSIGERVEGLL
QVENVADRLEELEELGDREEATFRIVEEVIKELKVKGDLPLHKRIDYAVRIGLAVL
TEAVVSAPLEGIAAVEIRERGTGHRVDESEPPHEEPKLVCTECGKEVDPENCYLA
50 VKYAGPIRAAGGTAAALSALLADYARQVAGLPRFNPDDFDHDLVGRYVEEVVTYLD
KVG SFQYNPSEEEVELVAKNIPIEIDGEPTEEVEVQGH RDIPHLPNQLRG GALLVICE
GICQKAPKLIK RVEKYGIDGW EFLEKLVNKGSDDEEEGEEKTKIKPNDKYM GELVA

GRPLLSHPSAKGGFRLRYGRARNTGFAAVGVHPSLMYVTKGFIVIGTQLKVERPGK
AACVLPVTEIEPPVVKLRDGSVVRLLDDPREAKELVEKDEIEEILDGEMLVAVGEFIE
NNHPLVPPAYCPEWWVKEVPDVVKVIGLRKNLPNDVFEKLDVPLKRLVKEASRLS
GNGNNLDGFLNGPVKVARSELVRKEVIPRLSSPERMSVEEAIELSREYGVPFHPK
5 YTFWLWHDVKPKDVDELREALEVAGSEWGNLRVEFENDGEIKRILEDLLVPHRLEDD
TIVVEEPWASALLAQLGYDPESGEFREQDELDYLLDYLVIRDETCRYVSKLAGFPI
REKAPTRIGARMGRPEKARERKMSPPPHVLFPFIGIAGGNQRDIMKFHRGESEDTDR
VEVCYRICPECDRLVPYRVCPCFGTETVQYCNRCDEPADECDCEPDVVRADIER
NDDPYSSLPVRELVRRAEEVGTDTLKGVKGMTSRLKMPEPLQKGILRAKRDLFV
10 FKDGTLRFDCNDCPLTHVRLKEVGLTPFKARLLGFERDINGDPVSEDQVVELYPQ
DVVLPKRAAEWAVRVCQYLLDLRKYYGLEPVYGVKEKPEDLIGHLIVTLAPHTSCGV
VGRVVGADINCWYNHPIINAARRRNCDEDAFMLLLDVLLNFSRLYLPDKRGGLM
DAPLVLTAVDPYEIDDEVWNMDVCGDYPLELYRKALEYADAGEAEELIERLEDRLD
LPRGLQFTHDTEAIDLGPTVTRYSRLEKMEEKLEEQDLARRIRAVDESDVAKIVLDS
15 HFLPDIKGNLRKFGRQKFRCSRCNAKFNPPLSGKCPRCGGDVLLTIYPATATKYLE
PAKRLVEEFGTHDEEWRTIASEVELLEEAKTLFGSDHSVSLKKFFGET

<SEQ ID No.:1651;PRT;Methanopyrus kandleri>
MRRELIERLESRLDRREIEKARRDSHARRRPRPCGITVHPGHGCPRACSYCIPEM
20 GFRFERARPYRLSGEGMVLALLYNRGFEPEGREGTFIAGSVTDPFPELADKTLEYL
RTFSRWLGNPTQFSTKSAIDGEVAESLARLELPLNGLVTILTPDREKASRLEPRAPR
PEERLETITELSKAGLTVDLFFRPILPGIVGLEEAEELFRMARDAGARGVVVGFRV
NEGILSRLKRSDFVSEIVNRANRPIPKGRKQVYVRTGDIKERLLRIAREVGLTPFGA
ACCACASAAQVPCPNRCWEGPFCTECGNPACPV

25 <SEQ ID No.:1652;PRT;Methanopyrus kandleri>
LRLYRRRDPEPQSPSSSEGGPLPLPSLALVPLISISALIVAALRGWGLFRASSLSLAL
YLIASFTFPTVQVPYVRVVDLSALKGVEILAVLASLTLVEMMREDGVLEDIVHILKET
CQLRGPCLVGLSVVATGAFESVAFGTPATLVGPLLVEAGLSKTTAAAAALVGHAP
30 FGVFAAFGVPIVLTSGVSGIDPKKLSFDVALCIAPSLVLPYAVAETADLRVSKVLLTT
MGIMTTASLLAVWWWASPSIVGPLLVLGVASGFLWYLRVAGEEARIKVSNDTIKGM
VYGLVVVGIGVVKALDVKWWQPWMLLWVAVLLYATPRWTRMVGALIRVLRKTWEE
LLSIVLLMVLGTIAHSELPSAIRPYAGSPLVTLVGFMGEMVVGSTTAVMATFASGT
PYPEITLAGAACAAAACPNVAVAAAVRCHEKRVMMRSLLGSMYLTVP TLAWCTM
35 LWIWGAMK

<SEQ ID No.:1653;PRT;Methanopyrus kandleri>
LKEFAVALHDKAPIYGLRIDNVVSYSSANGVEYLYELSDNELKLLQQYRRIGEVR
40 GFRVCSELGLDTLIWIAGRDGSSYYELKRILLTENSTVRHVYVNVSPNYLVTDDPS
LPGYFSVNCYWNGPDKIWYPYYLKLKGVEIVNVKDVPYPTYSSTIQLVSLVDILADAA
LKALTKAVKHELVSQQPPEVKAESHLLSALEGPEPPSPSALEEVMRKGGASEEFIE
SVLEGLRKYWSGSTGIGTSQRSPVNIITVLVTLWVRRRPPGGVARSARG

<SEQ ID No.:1654;PRT;Methanopyrus kandleri>
45 MSNYVIRLENVRKVYNSGSVKVEALKGVSLGVKNGEFLMIVGPSGSGKSTLLHIMG
ALDTPTSGRVEIAGKDMTNLSDEELAEIRNKYVGFVFQQYNLIESLTVLENVMFPMT
LAGEEDEERAKDLLRKVGLKEEHFDKFPSQLSGGEQQRVAIARALANDPEVILADEP
TGQLDTKNSQRIMKLLKLNDSGHTIVMTHDLSLVRWADRVILLRDRGRIEREMSPE
ELDAEVLD

50 <SEQ ID No.:1655;PRT;Methanopyrus kandleri>

- 5 LITIKVAIRNIARRSVRSLTILGVAIGVAAVVGISAIKGLQHDVKVAISGSASLIVKSKA
APDPLSSVLDESIEDEVRKIPGVKRTVAVWFNNRMITVGRQRQPILIAAVENRGYEL
VVGSKIEPIEGHLPKHGEMAFGSLIWRKLRPKVGETVDLSGQKLRVSGAFKTSSQLA
NMCAITTLDSVNKIRGKSISCVFVQTSDPKRVKREIESRINGVEAITTSKAVQGMLNN
10 LRTVELAAIALTGIAGVVGALGVANTMLMSVIERKREIGVMKAIGATNRDVMKLFLE
SIILSLAGGIIGCVLGMGLGSQLLVHILSYIKHQTVSVLITPEVLGLGLALALAIGVVSGLY
PAWKAACKVDPVEALRYE
- 15 <SEQ ID No.:1656;PRT;Methanopyrus kandleri>
MITLDTETTVEDLSESDVEGRIIYAPCKGCSPEEVPQEVVRATVHRKGPDEKGVPR
FVANVLARCESCGTVNPNVRLVIFYAPKKVKVTISRYEESECKEVEMDPLEEIEVGDVI
EVEGERVEITNIATHEEDSVKKAKVKDVVSVWGVSLDIPARIGVSINLPSGYTISEKV
EVDREDEFTVGEIYELDGMLFRVHAIKPEGRPTVKREGESVKAEEIKRIYGRPVRRG
TPKKSLESI
- 20 <SEQ ID No.:1657;PRT;Methanopyrus kandleri>
MEITLKARGHENVTGRHRSTFEVTKDPEIGPTADCIIGVRADTACADLPEDFKMLMR
RGARVEVILRAGGTEDRVVGVGHPRMTLQDGRSMVFRTSDYIDDRTVLIRCNAAR
DLSRDLVRALKDPETVLMVEMRVLVDVR
- 25 <SEQ ID No.:1658;PRT;Methanopyrus kandleri>
MVEILYKQPKGKRAYEEYALILDFLPYGRAEPPHQRQPVAQAIGKDDFFVLLELAPKE
GAFLELHEEVYVGRGKRDKIHVNRRLRYDELATAREELPHAVEKIIDNEEDFVR
FFNEARPITPRLHQLELLPGIGRKTLEERILEEREKEPFESLDDIKERVKGLRMHPRDM
IKERVLAELKGETRDKYRLFVPEFRGGGRKRR
- 30 <SEQ ID No.:1659;PRT;Methanopyrus kandleri>
LPSISLQARERSPTNVHEARKVVEKVLKERDPELTYDQREAVRYLKKGFSLEPEDLE
EAKEELRSILGDLTTNERTVEILVNKILEVQPRSEEEIKVLLESAGKRLLRRADEDVVR
AILEVSERIAEEE
- 35 <SEQ ID No.:1660;PRT;Methanopyrus kandleri>
LVRRSKGFRSRTRKLRKKPRERGLSPLGPMTQEFEEGQKVHIVIDPSVHKGMPPH
RYHGRTGEVVGRQGRAYIVKIRDGGKEKKLIVYPEHLKPQEQPELQ
- 40 <SEQ ID No.:1661;PRT;Methanopyrus kandleri>
VVVVYHRPFSHFRVNHVALIAGNLGAKLLVYSEPKSRAALDGITQVLEHPEERGRV
PVMVVDLDDALEVVDGRVALLDPSADEGIKKLPSDVLLTVPVELLEEIDIEPDLT
GVSAPVGELAAALAVVLYELGGA
- 45 <SEQ ID No.:1662;PRT;Methanopyrus kandleri>
MYENISTMDDFEFENKWVLLRIDINSTVIDGKIEDDERIKRHLGTIKELMEHDARVAIL
AHQGRPGEDDFTTLEPHAEIMSEELDNFEYVPDVFGPTAKKKIRSLEPGEVILLENV
RFYSEERINRDPEWHARRHLVRNLAPLFDIFVNDFAAAHRSNASLVGFTRRLPSC
VGRVMEREIEVLETMVRDEMEDGVFVIGGSKIEDAIKVIRRAIEMDNVRRVLLGGLV
GNLFLWASGVDLGKPSRKFLDMKGYTGYLDEARELLEEGDDVILVPEDVALNRGGE
REEVDVDELPAAPVFDIGTGTIERYRKEVESAGMVVANGPMGVYEEPGFEKGTYE
VLNAIADSEAFSVIGGGHIIAAAKACGAYDSIDHVSTGGGAMLRMLAGERLPAIDAILT
CPFSGC
- 50 <SEQ ID No.:1663;PRT;Methanopyrus kandleri>

LDRIRKIMRREAIEVIEYACNNLPEEDVKKALDLVVEKIRNDRGIFIVGMGRTGLIGECF
AVRLVQMGARCYVVGHSTERAIPDDLLIALSVSGNTAFVNYAADVAKDEGADVLA
VTMNADSKIAEKADV VVLPEPEEIIIRTFSEMLMLSFLDGFTAQLAKELGVDES DM
WERHAKIQ

5

<SEQ ID No.:1664;PRT;Methanopyrus kandleri>

10

MLRVPPVIVNFKAYSEAVGENALRLARVAAEVSEETGVEVGICPPHVDLRD VVREV
GDEVTVLAQAVDAAEPGGRTGHVTPEMVVEAGADGTLNHSERRMLLEDLKD VCR
ACINEGLLTIVCASDALAARAAGALSPHAVAVEPPELIGTGTVPVSKADPEVVERSVEV

15

<SEQ ID No.:1665;PRT;Methanopyrus kandleri>

LSGKRNAARKAAEEVCRRGYEVIGVGAGTTVEAFLEELVKREADVLVFTTIPGTIDA
CRRIGLNVTTIPPEELPVAIDGADAVDPDGNLLKGGGACHSLEKAIDYTADEFWVVV
DESKLVENLWELPVPVEVLRGCYELTVRTLEEFGEVRPRTCDEKYGPVSDSGNPI
VDLHVDDWDPAELERELNSVPGVVECGVFP GDKVDRIIVGRS

20

<SEQ ID No.:1666;PRT;Methanopyrus kandleri>

MSDKVLVIGAGPNRIGQGIEFDYCTVHAVWAIQEEGYKAIIVNNNPETVSTDYDTSD
KLYFEPITLEDVLNIVEKERPIGVLTQFGGQTSVNLTVPLAERGVRVLGTD PDDVDRL
EDRDRFSKLLKKGIPQPESGTANDPEEA VEVAEDIGYPVLVRPSYVIGGRAMEIVY
DEEDLRRYIEEAAKVSPEHPILIDRFIEGGIECEIDGARDEAGNVLIPGIMEHIEEAGVH
SGDSACVPPQTLPEHAQETVLEYAEDIAEGANVIGLINIQFVYDPEEDEVYVIEANP
RASRTVPFISKAVGIPLAKIGTKAILGREIPEVLDEMGLEPPDGDPGIVAVKEAVFSFE
25 KWPGVDPVLPPEMKATGEVMGIDRTFGAAYWKAQLAAGHELPLEGTAVISVADRD
KPDIVPIARKLQRLGFDLLATRG TASHLREHGIECEVVRKVSEGSPNIVDLIREGEIDL
IINTPTGKDAARRDGYAIRRAAVKFKVPYITTIAAKAAVEAIELVKEKGVTVNCLHDIH
KGDWTPREVKPEELTRYGG

30

<SEQ ID No.:1667;PRT;Methanopyrus kandleri>

LIVLATSEGVKLGRRLAEELDAELAPVEEDRFPDGEQIVRVPPPELDGT VVVVHSMSP
PQDENLVKAIITLDAARENGAEEVIAIVPYMAYSRQDRRFEPGEPVSFR AVARAVSA
NADALITVDLHEPGTLKYFDVPAENVSAAEELGKYLAERFEGEDLVVIGPDEGAREL
AREVASICGVEYDHLEKKRLSGDEVEIHPKELDVEGRTVVLVDDMIDTGGTMVEAA
35 RALRDQGAGTLYAACHTALLTRNAATRLLASGFEDIIATDTPPNPF EKVSAPPVAE
AVENLSG

40

<SEQ ID No.:1668;PRT;Methanopyrus kandleri>

LTELQVG DYARYVRTGTVGKVVDVKEREDGRWIQLDSTGLYYHEDYVEKVEKES
KEKEETDIEE VVERIRELKEAFEHVDERVCEGGG

45

<SEQ ID No.:1669;PRT;Methanopyrus kandleri>

MRVSELLQRHVITNRG HDLGTVM EVELAWKDKCIKALLVQPSKEYAQQVKADVVEV
PWSSVLAVGKYVLVDESKIRPRR

50

<SEQ ID No.:1670;PRT;Methanopyrus kandleri>

VMAGGRAKRMGGVEKPAVEVAGKPLLWVLEALQDCCCVD RITVAVSRDAGVTRS
IAERLGAEVVTPGDGYVHDLRFALESVGTPALTVTADLPCLTPDIVGLVIAAWA AVP
EPSLSVWVPRSLIVKAGLSLWRRFESTVGNVRVAVVGLNVVGG LRKTDEFKLLLDE
PRLAYNVNTWHDLRKVEGVLRSCPREERAQGLQALKTR

<SEQ ID No.:1671;PRT;Methanopyrus kandleri>

VIRVEFLKVFRFLTVLPIGEHPKSPREIGEQA WLGLPAVGLVSGLLAGVVAWAFAGT
PVRGCLVVLTLVLLEGAQHFDGLVDVGDALMAGVISEEGATKAMRDPRVGVGGLAI
GSMALLAVASFGWIPFEVLVPIEVFSRFTVLPMAAVGEPAPASYSGRVFTEYVDAD
QVLLGGILSTVVS LPPFSPVATLTCAVCSAVVAWTCLEAARTIRGVNGDFLGASIWV
5 SRVLSAVCLSSLPW

<SEQ ID No.:1672;PRT;Methanopyrus kandleri>

VEFFHVIKDERAVVLEFENPVKYVSSAFYS DGVGEVRWVANIRVEKGWSHDDPWG
YVEERLHELGLEPEDTLAFLTAADVEQA AIVQKGDVFAVATAGFGNAYCSKTKEHDL
10 GPGGTVNVI AVVGRPLTTRSLVEALTWAVEAKCHGVL RIVLGNEGPCLGTTTDSVA
VLC PQGDELDSFCGPATELGRR LMSAVEEAVVTAGERAGYSPTRSIK TLEEEGIEL
NDLVEAGRELFVGEWKEEHASRVLEELER GLENPNVALAVFTALLIDRFVRLGTYPE
ECGELREDPGWVYFDEV LGQFVAMELGGY GALFNFKRYDEEKP GILKEVDERWV
MLDDVLAGLVAGAMTA AFRRG

<SEQ ID No.:1673;PRT;Methanopyrus kandleri>

VAEAERPAGKEYTTISEVSGPLMVVEGVEGAKYGEVVEVETPTGEVRRGQVLEAR
RDAAVVQVFEGTSGLDTTSTKVRFTGETLRIPVSTDLLGRILNGRGEPIDGGPEIVPE
DELDIHGAPINPAARKYPSDFIQTGISAIDGMNTLV RGQKLPIFSGSGLPHNELAAQIA
20 RQATVPGEEEEF AVVFAAMGITHEEAAFFRREFEETGALDRAVLILNLADDP SMERII
TPRIALTVAEYLAFENDMHVLVILDTMTNYCFAPGTRVITASGDVVEIDEIVERAAETA
VDGGLREGSTEVTVGVTNVRTLAAWDGDLTSNDVVAVEKIEAPSRVVRVTRSGA
ELV VSEDHKFLVDTEDGPRMVEASELKSGDELYSVREL RVSEKVPTYLELLLEAEDK
FYVHPTEEFEEA VAERYGSLAEACREKELPYRAREAKERRYELSEFARLATAVIES
25 VDEATEYIDYV TAGGRKRVKFSSPRPGKEVMYVAGLIASDGSVDTERGFVMFSNTE
RELLSAFEIIVTE EFGVDASKTENQNGVTMLRVNSRVLARVFERLADPKTVLKMPR
ELVAAYLAGYVDGDGHLKDGKIVITTADRERAGDLQ LLLKRLGVPSVLRRERD GAYDV
VVTGHDAELAEELPLRHPKKA EAAAASMSSGRSSRFDRVSRRFGRLLREVRKY
GVRASDLGSSSTISQIESGERRATRR LALEIVERLEE VVGDVVEEVRELRELAEGNYV
30 LDEVVEVETVEYEHEYLVDVTVVPDHTLV ENGIITSNCEALREISAAREEVPGRRG
YPGYMYTDLATIERAGCIRGRKGSITQMPILTMPHDDITHPIPDLTGYITEGQIVLSR
DLHRRGIYPPIDVLP SLSRLMDEGIGKGKTREDHPDLSNQLY AAYAEGRDLRDLVAV
VGEEALTERDRKFLKFADEF EQRFVKQGRDENRSIEETLDLGWELLAILPERELKRV
SDELIEKYHPKYRQKKEEQEE

<SEQ ID No.:1674;PRT;Methanopyrus kandleri>

VTQEILEDVNPTRMELLKLQDRIELAKKG HKLLKEKRDALIMEFFEMVKRASEIREQA
VKKLMEAYSKLAAAKVTVGEIGVERASMATGEEIKVDVGS RNVMGVVPIIERSVSED
GGSKVYGFADTSGALDEAMRAFTEAIDAVLELAEIEETLRLMAEEIERTKRRVNL
40 EHIVIPRLNTEKYIEMKLDEQERENFVRLKRVKDLIERKKLKEELERVVEEGAELPS
FE

<SEQ ID No.:1675;PRT;Methanopyrus kandleri>

MVFVSVAKRKVTERVRRRREP YDFKTD MFEGRFEPLIAAEDVTVEEGEDVIKVEPI
45 EIPPHTMVLLSPYARNPYGHVLAVAE EFPKMMELGRKVEQVYFAAVRHGRIRKGDV
LGVLLIELKGEE

<SEQ ID No.:1676;PRT;Methanopyrus kandleri>

MRDESRLDKYVIKEILRINRHLPRRRKTLEELLREERPHV VNRDGTKHYFDRDELER
50 LADILPRYLHGRLKLPILIELGYSGAAVIRGKA EVRVVCEVLGEEWRFSQDRVELNML
DVRKLRREFPTATQYMFSTEYIMGRPKVERRG

<SEQ ID No.:1677;PRT;Methanopyrus kandleri>
MAVELPKAAIERIFRQGIGERRLSQDAKDTIYDFVPTMAEYVANAAKSVLDASGKKT
LMEHLKALADVLMVEGVEDYDGELFGRATVRRILKRAKIERASSDAVDLYNKLICR
ATEELGEKAAEYADEDGRKTVQGEDVEKAITYSMPKGGEL

5 <SEQ ID No.:1678;PRT;Methanopyrus kandleri>
MPAWRRVNWVNFLEERREYQVSVAAEILDSMDNTLVVIPTGLGKTAIGVMVLSELVDE
GRAVFLAPTVPVLVNHARFIERATRGLDVKALTGRVVRPERRKVEWKSDVIVATPH
VIRNDIIEGRIDPDEASVIFDEAHRAVGGYPYVVSKEFNCLKVGLTASPGSDVKRI
10 KEVVQNLGIERIIVKTEEDPDVKYLGRVKVEWVDVELPEWFDNARRELQRAFERR
LELLEDMGFLQSSRNWVGKLLSLREEIREQMAKRRERASWCSRALGVVAEALRIA
RAREILETQGIEPFLRYVERLTERKRSSGGSSLRRLGDPNFQRAVRECKSASLRDE
PDHPKLPEVEELVKDVESALVFTQYVDTAKLIADYLKEIGISVGVLLGKEHMKEHEQL
DVIKSIKRGEICRVLVSTSVGEEGLDLPTECEVVLVYEPVPSEIRTIQRIQRTARDGAVG
15 NAHVLVARGSFPTLDEIYFHVARRREKKMLEAVMRVQEWLRKRKGKTTATSKNLRK
LRSRAKTLQFVGGGRSKRERDEVPPSRAPVIVVDSRELNTKVVEHLRRKPVVLE
RDTLELADYVVGEGVGVERKSESDFARSLLDGRLLMDQAREMTREFDRAVIVEGNP
RREIEPEAVD GALATLAVDFGISVLQSAGPEETAELLYRMAKRFEERQRPRPRKRR
STEDLRVEMLSICIPGVGPELARLLDEFGSIGDVVNASPSELKRVKGIGERKAREIR
20 RFLWS

<SEQ ID No.:1679;PRT;Methanopyrus kandleri>
LRLILTGPPGSGKTCFAELARELRQEGWRVAHVEADALRGFLWDEFDPKLEQVA
RELFLKSVETCLDAELDLVIADDTNYYSSMRRELALLALERKVPWGIVYLRTGLDTCL
25 RRNRERGEPIPEEVVRRYDRFEPPEPDRWWRATLVLDSSRVSEEVLEFVESGLR
VEKPKKRRRTDPSSVNEVDVTRQVMGELMRRLSETGAATQELGRKLSERREI
VSSVEDPEKAVREFRRRAEEVIRECLHGDG

<SEQ ID No.:1680;PRT;Methanopyrus kandleri>
30 MGISEKLGLSKGQRYVFFGGKGGVKTCAAATAVWLSEEEGKEVLVSTDPAAHS
LSDIFDQNIQSEPTPIEGVEGLKAEIDPEKAAEEYVEVMKRVYEMSKDKGMEDLFG
GEDLLKEQEELLKSSPGIDEAAAFQKFMELMKDDSYDVIVFDTAPTGHTLRLSVPE
TLERQVKTMIVRRRTLQVSKMLKTLIPFADSDDEDEDEILENLEKMKKEIEEIRETSL
DASLTAFLVMTPEEMAIYEARRALRTLNHYEIPVDMVIVNKMVMPKRADECEFCRTR
35 RKMEERLKLVEKYFGDKEIHQIPMFAEEVRGLGKIRQVAEILYGEP

<SEQ ID No.:1681;PRT;Methanopyrus kandleri>
LVRKPKKFPKRRYELHAHTYLTGELLPAEFLRRRAEELKHEALVFTEHVDPSNLEDA
VSRLAEACDALRGYYRTEPVGAELTHVPPDLIPELAEAEARDNGARVVLVHGETPA
40 EPVKPGTNEVAASCDVDVLAHPGLIDLETARMASENGVALEITTKRGHCLANGWV
VRVALETDELVLNTDAHLPGDLLKPEEAATAAMGAGLPEKMLKWVLEEVPRKILKK
R

<SEQ ID No.:1682;PRT;Methanopyrus kandleri>
45 VAPKSMKHIRNNVWVWELPEDYKGCMMKVPGRYATEKLIDGMEKGVFDQVANVACL
PGIYGYSIALPDAHGYGFPIGGVAAFDVEEGVVSPGGVGYDINCLAPGKILTEHG
CWVKVEDLPKMLTDQKLKVYDVDEGREDDSEIKFVMERGIEEDERAVVLVTESGLTI
EGSEDHPVLTPEGYVELGEIEEGDLVVYPFEGVEYEEKEGTILDESDFEDVDPQVL
RYLEERDLIPLRWSDPKVGTARILGFAMGDGHLGEQAGRLTSLFYGDERTLRELK
50 RDLES LGVKANLHVRKRRYEIETASGRYEGEATSVELRVASRSFALLMEKLGMPRG
RKVETPYKVPDWIKEAPLWVKRNFLAGLFAADGSVVKFKRYTLPINLTQAKVEELE
ENLREFMNDVAKLLREFGIETTLYEVKSKKNVVKLAIVGEENIKRFLGKVGYEYDPE

KKVEGLAAYAYLKLKERVKKDRKEAAETA AEVYEETGSITKAHEAVADVNNRRFVE
RVVYDGGISSVRVPEDFPTFERFKEERVLAGGFVIEEVVEVKGVEPEYDRFYDIGVC
HGAHNFIADGVVHNCGVVRVMTDLTEDDVRPKLRELLETIFRNVPAAGLSRHRRV
RLSTQELRQVMLYGAEWAVEEGFGFDEDLDHIESRGNMTHAYETIGWEEYGPRDD
5 VASKRAIERGRPQLGTLGSGNHFLVQVDEIYDKEAAEKMGIREEGQVTIMVHTG
SRGFGHQVCSDHLRIMERSMRDVERRFGVRIPDRQLACAAMGTDEAKRYFNAMN
AAANYAFANRQMISHWTRESFVEVFGDEYGDADDMGIEVIYDIAHNMAKIEKHPVD
GEERWLWVHRKGATRAFSEEALKKHGEPVPFEGLPQPVLIPGDMGTGSYLIGTEK
10 AMEETWGSTCHGAGRTMSRAAAKRKFWGEDVARELERQGILVKAASMPVVAEEA
PPAYKDVDEVRAVAEAGISDPVVRRLRPIGVVKG

<SEQ ID No.:1683;PRT;Methanopyrus kandleri>
MRVEVDPEVNDRGLRYAYVRVEGVDPGADASELVDRVTARLRERFDLDDLKDDPI
VRAYRDYLSIDVDPTKVRPAGEALLRRALRGNFPRINAVVDSYNLASAEYRVPISC
15 FDADKLTGDLIRPAESGEVMVDIAGERMELDDRFFVVADEDGPVSVSPYRDARRT
AVTDETERVLLLAHGVPGVEVEHLVEALKTAVRYLREGAEAESASRIVTP

<SEQ ID No.:1684;PRT;Methanopyrus kandleri>
VEGTRQRVFYGLLSRVYERSPLSLPKHLVKEILRDLKGCCRVLDVGCATGYLTRKLA
20 AVCDRVVGV DINRKMVEASQSRNRLPNVKFVRADAHNLPFPDACFDGIVLSEILQHL
DVIRALKEVDRVAARGCRMVVLDPDTSRAARVATRLIHVFTGNNAWVSPGTVVGI
MRDMDWKLVRVFSAGKRVLITMEKRGAGDAGRSGPGG

<SEQ ID No.:1685;PRT;Methanopyrus kandleri>
25 VIKRILPCTVLAMIVCTAVGLQPAHSEKAPVPKPPKLEEKKEEEKKEEKERKESTLKP
GKYKVAEADFKNGVVYLKPLYKPKVIPVKVPPRVIRKL RPGTVVEVHQRGSSSTVIR
TASGTAEGSTVITRTESSSGTMGHTTSSSEALQTGSTSSSTSTPSHTSVGTSAGAG
TYGNTTVNAKEKTVSSEGGKTAGSSKSKESKKGKREKKEKNRSSKEKIKVKRPKSSG
SSDLELQREASSGSSSGWAPYLVAIALVGAATGGMWLVKQRRSTTWWE

30 <SEQ ID No.:1686;PRT;Methanopyrus kandleri>
MFEGTGFGWVEYGGERYNHDIYVTEGKVRREKGLSRSKFGTSHNLADELRRRL
LELCDEEPEVIVVGTGQSGVLSVTEEAREFCEERGIELVEAPTPEAIERYNELKDKG
KKVAAVIHTTC

35 <SEQ ID No.:1687;PRT;Methanopyrus kandleri>
MTAFEVRDLRVYYGEEEEALKGITLDIPEKKITTIIGPSGCGKSTFLRCLNLMIKEIPYAR
TEGEVIFDGENVLEYEDEADIIAHHRRRVGTVFQHPNPFPMWSIYDNVAYGLRLMGM
DEDEIEDRVYEALEKAALLDQVEDRLDDPASALSGGQQQLCIARALAMRPEVLLM
40 DEPTSDLDPIATRKIEETVMELKGEVTIVFVTHLLPQAYRIGDYTAFFLHGELVEANST
EKLFTDPQDERTKEYIEVEFGPS

<SEQ ID No.:1688;PRT;Methanopyrus kandleri>
MREVAAKQAQESENLIKSATAAAISIAAVIGIYLFLLNGVKALQYDSVIDILFGTVW
45 RPDSYPPRLGLLPMIISTLYVTIADVIAFPISLLCATYLAEFAPRILRRTL RPAIDMLAGI
PSVYGLFGILTLVPFAREYLGAPTGYSVLVAGIIVAIMILPYMTSVMMEAMRAVPRE
YVEAALGMGATRWQVVRTVLWPAARSGITAGGMLGTLRAMGETVAVALVAGAAL
MIPTSPLDPCRPLSAHILLQATVLPVGSPPGYALYFGGLVLMMLMTGVIVLAYRYRR
RTGRIRVRKRKSHHARLNPVIVSKLMTGLMVLGAVIAAALVGITGYIFANGVGALS
50 WNILFGPINIGDPVHSSLYPALLGTLALMFYSTVFAALIGIPTALYLAEFAGDTAFTRA
VRFAIDTLAGVPSIVYGLFGATLFFVYMKMGYSVLGALTLAVMNLPMVMVRTAEAEAF
RSVPREYVEAARGMGASWFHVVRDVLLPMAKPGITAGITLSMCRAAEAAPIILTAV

MIGLISTNPFVHVLQPTDALAFRIYLIAKEYLMEPGARATAFAAATVLVAVTLGLNLLAI
YMRDKFERKIGRRG

<SEQ ID No.:1689;PRT;Methanopyrus kandleri>

5 N/A

<SEQ ID No.:1690;PRT;Methanopyrus kandleri>

10 VGG EILKKYLIAAVVAIAVIAGGAAYYYSTAGAVKTQLRIGGSTSLMPFMMKVAAYVG
EEHRMTWKQIGE QVG VQGLPDEPVQLMVSDGGSSAGIKGLIEGTFDIAMASRPLKP
EEAQQLSDPVMCPVVL SAIVPIVNGKTLGQLDDIDPKTLRDIYTGKIKYWDQVKPGLP
HKKIVVIGRAKGS GTRSTFDKYLNIQDYTKDAILCGSNSEVLEKVEKTPYAIGYVDYA
YVVKAKKGGKVPSAVKPLKVNGVEANEQTIIAKKYPLVRAEYLIIDRSNAPKTAIALIK
WIRKPDVNKEFAEKVGYVPVPEDAPLFSKKPYIEIKPLVK

15 <SEQ ID No.:1691;PRT;Methanopyrus kandleri>

LRQCRICGIPETVDGVELDESGVCACRRQIRHIPS RKELREKVRKALENSEKVLVA
VSGGLDSLALGLALRICDEVVALTVDTGALHPEAWRRILARRMSGIEWEIIIGDQKP
FLKLFEERLTRAESPCGPCSRMITRRYERRARELGVD AIVTGHELPHGTSPVVPKDP
PVIRAMCGMTENERREIVEEEFGLTVDKISGYTSNCIVLPFALKLFYMKYGY SFEAPR
20 LAAMVRYGYISREDMEQIMTPPTLSDLKELLRECEEWIPESLKQMLQKVINKISNSDL
GRENGD

<SEQ ID No.:1692;PRT;Methanopyrus kandleri>

25 LELLRKKVSGKKICVLISGGMDSAVATKILQLSNTDVRGLHITHRWMWFTPEIEIKRIS
KMLGIKIDVVDITDELRRRLRGAKGKSVCKICKKIMLEIAVSKASVVATGECGMDTIA
GAVLDVSRRTGIEPEFVQLPKRYFNGDDRIIVRPLIRIHESDVKRLARLLGVKVR RVG
ETGDLRRGRREGCPLQHLDPWVDVTDELMDEVWDVNVEALLVARRLGRRVSVKW
PSFRIILEGSPEERRHVAECVWYRWVRAGRPRRYR

30

ATTACHMENT C

Functional Classes

- 5 INFORMATION STORAGE AND PROCESSING
 [J] Translation, ribosomal structure and biogenesis
 [A] RNA processing and modification
 [K] Transcription
 [L] Replication, recombination and repair
 [B] Chromatin structure and dynamics
- 10 CELLULAR PROCESSES AND SIGNALING
 [D] Cell cycle control, cell division, chromosome partitioning
 [Y] Nuclear structure
 [V] Defense mechanisms
 15 [T] Signal transduction mechanisms
 [M] Cell wall/membrane/envelope biogenesis
 [N] Cell motility
 [Z] Cytoskeleton
 [W] Extracellular structures
 20 [U] Intracellular trafficking, secretion, and vesicular transport
 [O] Posttranslational modification, protein turnover, chaperones
- METABOLISM
 [C] Energy production and conversion
 25 [G] Carbohydrate transport and metabolism
 [E] Amino acid transport and metabolism
 [F] Nucleotide transport and metabolism
 [H] Coenzyme transport and metabolism
 [I] Lipid transport and metabolism
 30 [P] Inorganic ion transport and metabolism
 [Q] Secondary metabolites biosynthesis, transport and catabolism
- POORLY CHARACTERIZED
 [R] General function prediction only
 35 [S] Function unknown

TABLE 1

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|-------|------|--------|--------------------|------|--|----------------|------------------|
| 0001 | 748 | 1806 | - | 352 | RCL1 | RNA 3'-terminal phosphate cyclase | COG0430 | [A] |
| 0002 | 1888 | 2403 | - | 171 | lbpA | Molecular chaperone (small heat shock protein) | COG0071 | [O] |
| 0003 | 2357 | 3415 | - | 352 | | Predicted GTPase | COG1084 | [R] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|-------|-------|--------|--------------------|--------|--|-------------------|------------------|
| 0004 | 3490 | 3807 | + | 105 | RPP1A | Ribosomal protein L12E/L44/L45/RPP1/RPP2 | COG2058 | [J] |
| 0005 | 3811 | 5343 | - | 510 | | Replication factor C (ATPase involved in DNA replication) | COG0470 | [L] |
| 0006 | 5349 | 7256 | - | 635 | | Replication factor C (ATPase involved in DNA replication) intein containing | COG0470 & COG1372 | [L][L] |
| 0007 | 7315 | 8682 | - | 455 | TIP49 | DNA helicase TIP49, TBP-interacting protein | COG1224 | [K] |
| 0008 | 8796 | 9161 | + | 121 | DsrE | Uncharacterized conserved protein involved in intracellular sulfur reduction | COG1553 | [P] |
| 0009 | 9299 | 10450 | + | 383 | | Uncharacterized protein specific for M.kandleri, MK-36 family | | |
| 0010 | 10400 | 11074 | - | 224 | | Predicted dinucleotide-utilizing enzyme of the ThiF/HesA family | COG4015 | [R] |
| 0011 | 11167 | 12018 | + | 283 | Mtd | F420 dependent N5,N10-methylenetetrahydromethanopterin dehydrogenase | COG1927 | [C] |
| 0012 | 11999 | 12547 | - | 182 | | Uncharacterized protein conserved in archaea | COG4016 | [S] |
| 0013 | 12672 | 13748 | + | 358 | Hmd | H2-forming N5,N10-methylenetetrahydromethanopterin dehydrogenase | COG4074 | [C] |
| 0014 | 13791 | 14549 | + | 252 | | Uncharacterized protein conserved in archaea | COG4017 | [S] |
| 0015 | 14518 | 15279 | + | 253 | | Uncharacterized conserved protein | COG0327 | [S] |
| 0016 | 15236 | 16306 | + | 356 | | Biotin synthase and related enzymes | COG0502 | [H] |
| 0017 | 16252 | 17787 | + | 511 | | Uncharacterized protein conserved in archaea, FLPA ortholog | COG4018 | [S] |
| 0018 | 17781 | 18263 | + | 160 | | Uncharacterized protein conserved in archaea | COG4019 | [S] |
| 0019 | 18347 | 19369 | + | 340 | | Collagenase and related proteases | COG0826 | [O] |
| 0020 | 19326 | 19685 | + | 119 | | Predicted metal-binding protein | | |
| 0021 | 20108 | 20878 | - | 256 | Pnp | 5'-methylthioadenosine phosphorylase | COG0005 | [F] |
| 0022 | 20875 | 21456 | - | 193 | Cmk | Cytidylate kinase | COG1102 | [F] |
| 0023 | 21460 | 21801 | - | 113 | RPL34A | Ribosomal protein L34E | COG2174 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|-------|-------|--------|--------------------|--------|---|-------------------|------------------|
| 0024 | 21809 | 22345 | - | 178 | | Predicted membrane protein | COG1422 | [S] |
| 0025 | 22359 | 22934 | - | 191 | AdkA | Archaeal adenylate kinase | COG2019 | [F] |
| 0026 | 22954 | 24330 | - | 458 | SecY | Preprotein translocase subunit SecY | COG0201 | [U] |
| 0027 | 24397 | 24861 | - | 154 | RplO | Ribosomal protein L15 | COG0200 | [J] |
| 0028 | 24876 | 25325 | - | 149 | RpmD | Ribosomal protein L30/L7E | COG1841 | [J] |
| 0029 | 25473 | 26153 | - | 226 | RpsE | Ribosomal protein S5 | COG0098 | [J] |
| 0030 | 26170 | 26778 | - | 202 | RplR | Ribosomal protein L18 | COG0256 | [J] |
| 0031 | 26782 | 27231 | - | 149 | RPL19A | Ribosomal protein L19E | COG2147 | [J] |
| 0032 | 27295 | 27900 | - | 201 | | C4-type Zn finger | COG1779 | [R] |
| 0033 | 27917 | 28900 | - | 327 | | 2-phosphoglycerate kinase & Predicted small molecule binding protein (contains 3H domain) | COG2074 & COG1827 | [G][R] |
| 0034 | 28904 | 29251 | - | 115 | | Uncharacterized conserved protein | COG2450 | [S] |
| 0035 | 29245 | 30336 | - | 363 | | Uncharacterized conserved protein | COG3367 | [S] |
| 0036 | 30390 | 30980 | - | 196 | | GTPase SAR1 and related small G proteins | COG1100 | [R] |
| 0037 | 31183 | 31749 | + | 188 | | Predicted hydrolase of HD superfamily | COG1896 | [R] |
| 0038 | 31721 | 32782 | + | 353 | PelA | Predicted RNA-binding protein pelota | COG1537 | [R] |
| 0039 | 33253 | 34011 | - | 252 | | RecA-superfamily ATPase implicated in signal transduction | COG0467 | [T] |
| 0040 | 34081 | 35229 | + | 382 | | Uncharacterized conserved protein | COG1602 | [S] |
| 0041 | 35263 | 37083 | + | 606 | | Uncharacterized conserved protein | COG1542 | [S] |
| 0042 | 37451 | 38404 | - | 317 | | Uncharacterized protein | | |
| 0043 | 38495 | 39829 | - | 444 | | tRNA and rRNA cytosine-C5-methylases | COG0144 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|-------|-------|--------|--------------------|-------|--|----------------|------------------|
| 0044 | 40642 | 41649 | - | 335 | | Fe-S oxidoreductase similar to Oxygen-independent coproporphyrinogen III oxidase (like hemN) | COG1242 | [R] |
| 0045 | 41815 | 42918 | + | 367 | | Predicted GTPase of the YlqF family | COG1161 | [R] |
| 0046 | 43093 | 43638 | + | 181 | | SAM-dependent methyltransferase | COG0500 | [QR] |
| 0047 | 43671 | 44753 | - | 360 | | Pyruvate-formate lyase-activating enzyme | COG1180 | [O] |
| 0048 | 44786 | 45367 | + | 193 | | Uncharacterized conserved protein | COG1590 | [S] |
| 0049 | 45367 | 49032 | + | 1221 | RgyB | Reverse gyrase, subunit B | COG1110 | [L] |
| 0050 | 49029 | 49949 | + | 306 | | Uncharacterized protein | | |
| 0051 | 49918 | 50835 | - | 305 | | Predicted ATPase of the PP-loop superfamily implicated in cell cycle control | COG0037 | [D] |
| 0052 | 50862 | 51494 | + | 210 | GlpG | Predicted membrane serine protease of the Rhomboid superfamily | COG0705 | [R] |
| 0053 | 51991 | 53284 | + | 431 | AmtB | Ammonia permease | COG0004 | [P] |
| 0054 | 53306 | 53659 | + | 117 | | Nitrogen regulatory protein PII | COG0347 | [E] |
| 0055 | 53735 | 54652 | - | 305 | | Fe-S oxidoreductase | COG0731 | [C] |
| 0056 | 55284 | 55847 | - | 187 | | Uncharacterized protein conserved in archaea | COG1772 | [S] |
| 0057 | 55840 | 56433 | - | 197 | | Uncharacterized conserved protein | COG1628 | [S] |
| 0058 | 56430 | 56768 | - | 112 | RPB11 | DNA-directed RNA polymerase, subunit L | COG1761 | [K] |
| 0059 | 56784 | 57464 | - | 226 | | Uncharacterized protein conserved in archaea | COG3286 | [S] |
| 0060 | 57457 | 58047 | - | 196 | | Predicted RNA-binding protein (consists of S1 domain and a Zn-ribbon domain) | COG1096 | [J] |
| 0061 | 58044 | 59066 | - | 340 | RecJ | Single-stranded DNA-specific exonuclease | COG0608 | [L] |
| 0062 | 59083 | 59697 | - | 204 | | Predicted RNA methylase | COG2263 | [J] |
| 0063 | 59694 | 59882 | - | 62 | | Zn-ribbon containing protein | | |
| 0064 | 59908 | 60720 | + | 270 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|-------|-------|--------|--------------------|-------------------|--|----------------|------------------|
| 0065 | 60717 | 61094 | - | 125 | | Uncharacterized conserved protein | COG4744 | [S] |
| 0066 | 61097 | 61705 | - | 202 | TolQ | Biopolymer transport proteins | COG0811 | [U] |
| 0067 | 61681 | 62895 | - | 404 | | Predicted transporter | COG4827 | [R] |
| 0068 | 62910 | 63524 | - | 204 | | Uncharacterized protein | | |
| 0069 | 63592 | 63867 | - | 91 | | Uncharacterized protein | | |
| 0070 | 63864 | 65960 | - | 698 | | Superfamily I DNA/RNA helicase | COG1112 | [L] |
| 0071 | 66184 | 66945 | + | 253 | | ATP-utilizing enzymes of the PP-loop superfamily | COG1606 | [R] |
| 0072 | 66957 | 68126 | - | 389 | | Uncharacterized protein specific for M.kandleri, MK-21 family | | |
| 0073 | 68133 | 69011 | - | 292 | NadA | Quinolinate synthase | COG0379 | [H] |
| 0074 | 69027 | 69896 | - | 289 | | Predicted metal-dependent hydrolase of the urease superfamily | COG1831 | [R] |
| 0075 | 69998 | 70933 | + | 311 | | Uncharacterized protein | | |
| 0076 | 70930 | 71757 | + | 275 | | Uncharacterized domain specific for M.kandleri, MK-33 family | | |
| 0077 | 71931 | 73088 | + | 385 | | Predicted GTPase or GTP-binding protein | COG1341 | [R] |
| 0078 | 73121 | 74119 | + | 332 | | Predicted carbohydrate kinase of the FGGY family | COG4020 | [S] |
| 0079 | 74116 | 74928 | + | 270 | TyrA ₁ | Prephenate dehydratase | COG0077 | [E] |
| 0080 | 74941 | 75492 | + | 183 | PorG ₁ | Pyruvate:ferredoxin oxidoreductase, gamma subunit | COG1014 | [C] |
| 0081 | 75485 | 75754 | + | 89 | PorD | Pyruvate:ferredoxin oxidoreductase, delta subunit | COG1144 | [C] |
| 0082 | 75767 | 76918 | + | 383 | PorA ₁ | Pyruvate:ferredoxin oxidoreductase, alpha subunit | COG0674 | [C] |
| 0083 | 76931 | 77821 | + | 296 | PorB ₁ | Pyruvate:ferredoxin oxidoreductase, beta subunit | COG1013 | [C] |
| 0084 | 77794 | 78321 | + | 175 | | Fe-S-cluster-containing hydrogenase component | COG1142 | [C] |
| 0085 | 78242 | 79153 | + | 303 | TtdA | Tartrate dehydratase alpha subunit/Fumarate hydratase class I, N-terminal domain | COG1951 | [C] |
| 0086 | 79158 | 79691 | + | 177 | FumA | Tartrate dehydratase beta subunit/Fumarate hydratase class I, C-terminal domain | COG1838 | [C] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|------|---|----------------|------------------|
| 0087 | 79695 | 80291 | + | 198 | purO | Archaeal IMP cyclohydrolase | COG3363 | [F] |
| 0088 | 80293 | 82308 | - | 671 | | Predicted RNA-binding protein homologous to eukaryotic snRNP | COG1293 | [K] |
| 0089 | 82341 | 83522 | - | 393 | | FOG: CBS domain | COG0517 | [R] |
| 0090 | 83620 | 83895 | + | 91 | | Uncharacterized membrane protein, conserved in archaea | | |
| 0091 | 83902 | 85701 | + | 599 | | Predicted ATPase, RNase L inhibitor (RLI) homolog | COG1245 | [R] |
| 0092 | 86099 | 86650 | - | 183 | | Predicted phosphoesterase | COG0622 | [R] |
| 0093 | 86682 | 87470 | - | 262 | | Uncharacterized conserved protein | COG4021 | [S] |
| 0094 | 87467 | 88255 | - | 262 | | Predicted dinucleotide-utilizing enzyme | COG1712 | [R] |
| 0095 | 88185 | 88820 | - | 211 | | Uncharacterized conserved protein | COG2428 | [S] |
| 0096 | 88832 | 89203 | - | 123 | | Uncharacterized conserved protein | COG1873 | [S] |
| 0097 | 89216 | 90763 | + | 515 | | Predicted carbamoyl transferase, NodU family | COG2192 | [O] |
| 0098 | 90768 | 91475 | + | 235 | RibD | 2,5-diamino-6-ribosylamino-4(3H)-pyrimidinone 5'-phosphate reductase, riboflavin biosynthesis | COG1985 | [H] |
| 0099 | 91472 | 91828 | + | 118 | | Zn-ribbon-containing protein | | |
| 0100 | 91983 | 93164 | + | 393 | | Uncharacterized protein specific for M.kandleri, MK-36 family | | |
| 0101 | 93378 | 93962 | + | 194 | Tmk | Thymidylate kinase | COG0125 | [F] |
| 0102 | 93969 | 94385 | + | 138 | | Holliday junction resolvase, archaeal type | COG1591 | [L] |
| 0103 | 94354 | 95916 | - | 520 | AsnB | Asparagine synthase (glutamine-hydrolyzing) | COG0367 | [E] |
| 0104 | 95989 | 98838 | + | 949 | | Uncharacterized protein specific for M.kandleri, MK-40 family | | |
| 0105 | 98775 | 99845 | - | 356 | | Diverged homolog of ATP-dependent DNA ligase (eukaryotic ligase III) | | |
| 0106 | 99868 | 101157 | - | 429 | ThiC | Thiamine biosynthesis protein ThiC | COG0422 | [H] |
| 0107 | 101154 | 102512 | - | 452 | | Predicted diverged member of adenylate cyclase 3 family | | |
| 0108 | 102514 | 103230 | - | 238 | | Uncharacterized protein conserved in archaea | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|------------------|---|---------------------|------------------|
| 0109 | 103269 | 104672 | + | 467 | Lys C | Aspartokinase | COG 0527 | [E] |
| 0110 | 104669 | 105400 | + | 243 | | Uncharacterized protein | | |
| 0111 | 105387 | 107522 | - | 711 | | Superfamily II helicase | COG 1204 | [R] |
| 0112 | 107561 | 108058 | + | 165 | Paa Y | Carbonic anhydrases/acetyltransferases, isoleucine patch superfamily | COG 0663 | [R] |
| 0113 | 108066 | 109103 | - | 345 | | Predicted sugar kinase of the RNaseH/HSP70 fold | COG 1548 | [KG] |
| 0114 | 109078 | 110001 | - | 307 | | Predicted ATP-utilizing enzymes of the ATP-grasp superfamily | COG 1821 | [R] |
| 0115 | 110027 | 111160 | + | 377 | | Uncharacterized conserved protein | COG 1944 | [S] |
| 0116 | 111223 | 112113 | - | 296 | Ftr ₁ | Formylmethanofuran:tetrahydromethanopterin formyltransferase | COG 2037 | [C] |
| 0117 | 112165 | 113037 | - | 290 | Aro E | Shikimate 5-dehydrogenase | COG 0169 | [E] |
| 0118 | 113009 | 113827 | - | 272 | | Calcineurin superfamily phosphatase (nuclease) with Zn-cluster | COG 0622 | [R] |
| 0119 | 113841 | 114335 | - | 164 | Ubi C | 4-hydroxybenzoate synthetase (chorismate lyase) | COG 3161 | [H] |
| 0120 | 114352 | 115302 | - | 316 | | Uncharacterized archaeal coiled-coil protein | COG 1340 | [S] |
| 0121 | 115299 | 115952 | - | 217 | Ser B | Phosphoserine phosphatase | COG 0560 | [E] |
| 0122 | 115928 | 117214 | - | 428 | GlyA | Glycine/serine hydroxymethyltransferase | COG 0112 | [E] |
| 0123 | 117235 | 117816 | + | 193 | | Uncharacterized protein | | |
| 0124 | 117823 | 118356 | + | 177 | | Ferredoxin domain containing protein | COG 4739 | [S] |
| 0125 | 118374 | 118637 | + | 87 | | Zn-ribbon containing protein | | |
| 0126 | 118826 | 120259 | + | 477 | | Kef-type K ⁺ transport systems (NAD-binding component fused to domain related to exopolyphosphatase) | COG 1226 & COG 0618 | [P][R] |
| 0127 | 120262 | 122115 | - | 617 | Glm S | glucosamine-fructose-6-phosphate aminotransferase | COG 0449 | [M] |
| 0128 | 122121 | 123176 | - | 351 | | Acetylornithine deacetylase/Succinyl-diaminopimelate desuccinylase and related deacylases | COG 0624 | [E] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|-----------|---|---------------------|------------------|
| 0129 | 123173 | 125095 | - | 640 | GatE | Archaeal Glu-tRNA ^{Gln} amidotransferase subunit E (contains GAD domain) | COG 2511 | [J] |
| 0130 | 125187 | 125582 | + | 131 | Ada | Methylated DNA-protein cysteine methyltransferase | COG 0350 | [L] |
| 0131 | 125594 | 126139 | + | 181 | | Uncharacterized conserved protein | COG 2029 | [S] |
| 0132 | 126133 | 127611 | + | 492 | FrdB/GlpC | Succinate dehydrogenase/fumarate reductase Fe-S protein | COG 0479 & COG 0247 | [C][C] |
| 0133 | 127591 | 128607 | - | 338 | TruB | Pseudouridine synthase of the TruB family | COG 0130 | [J] |
| 0134 | 128665 | 134793 | - | 2042 | | Cobalamin biosynthesis protein CobN and related Mg-chelatases | COG 1429 | [H] |
| 0135 | 134868 | 136871 | - | 667 | | Terpene cyclase/mutase family protein | | |
| 0136 | 137011 | 137391 | - | 126 | | Predicted transcriptional regulator | COG 0640 | [K] |
| 0137 | 137551 | 138318 | - | 255 | | Uncharacterized conserved protein | COG 2106 | [S] |
| 0138 | 138349 | 139011 | + | 220 | ComB | 2-phosphosulfolactate phosphatase | COG 2045 | [HR] |
| 0139 | 139012 | 139761 | + | 249 | | Uncharacterized conserved protein, PrgY homolog (pheromone shutdown protein) | COG 1916 | [S] |
| 0140 | 139843 | 140517 | + | 224 | | Uncharacterized protein conserved in archaea | COG 1810 | [S] |
| 0141 | 140548 | 141339 | - | 263 | | Predicted permease | COG 0730 | [R] |
| 0142 | 141415 | 141891 | + | 158 | | Universal stress protein UspA and related nucleotide-binding proteins | COG 0589 | [T] |
| 0143 | 141888 | 142646 | - | 252 | | Predicted permease | COG 0730 | [R] |
| 0144 | 142704 | 143494 | - | 263 | | Predicted ATPase of the PP-loop superfamily implicated in cell cycle control | COG 0037 | [D] |
| 0145 | 143437 | 143949 | + | 170 | | Uncharacterized conserved protein | COG 2410 | [S] |
| 0146 | 143918 | 146485 | - | 855 | | Predicted P-loop ATPase fused to an acetyltransferase | COG 1444 | [R] |
| 0147 | 146611 | 147321 | + | 236 | | Uncharacterized protein conserved in archaea | | |
| 0148 | 147400 | 148779 | - | 459 | | Selenocysteine-specific translation elongation factor | COG 3276 | [J] |

| SEQ ID NO. | Start | Stop | Status | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0149 | 148789 | 149439 | - | 216 | | Uncharacterized membrane protein | | |
| 0150 | 149446 | 150267 | - | 273 | | Uncharacterized protein conserved in archaea | COG 4022 | [S] |
| 0151 | 150225 | 150746 | + | 173 | | Uncharacterized conserved protein | COG 1720 | [S] |
| 0152 | 150700 | 152415 | - | 571 | GRS1 | Glycyl-tRNA synthetase, class II | COG 0423 | [J] |
| 0153 | 152432 | 153412 | - | 326 | SgbH | 3-hexulose-6-phosphate synthase | COG 0269 | [G] |
| 0154 | 153397 | 154548 | - | 383 | TRM1_1 | N2,N2-dimethylguanosine tRNA methyltransferase | COG 1867 | [J] |
| 0155 | 154583 | 154855 | - | 90 | | Ribosomal protein L35AE/L33A | COG 2451 | [J] |
| 0156 | 154883 | 156067 | + | 394 | | Predicted pyridoxal-phosphate-dependent enzyme apparently involved in regulation of cell wall biogenesis | COG 0399 | [M] |
| 0157 | 156089 | 158347 | + | 752 | | Archaea-specific RecJ-like exonuclease, contains DnaJ-type Zn finger domain | COG 1107 | [L] |
| 0158 | 158344 | 158832 | - | 162 | SrtA | Sortase (surface protein transpeptidase) | COG 3764 | [M] |
| 0159 | 158829 | 159656 | - | 275 | | Predicted membrane protein | | |
| 0160 | 159680 | 160726 | - | 348 | | Uncharacterized protein conserved in archaea | COG 1627 | [S] |
| 0161 | 160771 | 161502 | - | 243 | PssA | Phosphatidylserine synthase | COG 1183 | [I] |
| 0162 | 161509 | 162153 | - | 214 | Psd | Phosphatidylserine decarboxylase | COG 0688 | [I] |
| 0163 | 162159 | 162707 | - | 182 | | SAM-dependent methyltransferase | COG 0500 | [QR] |
| 0164 | 162731 | 163357 | + | 208 | | GTPase SAR1 and related small G proteins | COG 1100 | [R] |
| 0165 | 163354 | 163716 | + | 120 | | Uncharacterized protein conserved in archaea | COG 3365 | [S] |
| 0166 | 163730 | 163984 | + | 84 | | Zn-ribbon containing protein | COG 3364 | [R] |
| 0167 | 163989 | 164609 | + | 206 | | Uncharacterized protein conserved in archaea | | |
| 0168 | 164625 | 165806 | + | 393 | MreB | Actin-like ATPase involved in cell morphogenesis | COG 1077 | [D] |
| 0169 | 165843 | 166553 | + | 236 | | Histidinol phosphatase and related hydrolases of the PHP family | COG 1387 | [ER] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0170 | 166637 | 167686 | + | 349 | | tRNA and rRNA cytosine-C5-methylases | COG0144 | [J] |
| 0171 | 167695 | 168651 | + | 318 | HtpX | Zn-dependent protease with chaperone function | COG0501 | [O] |
| 0172 | 168617 | 169261 | - | 214 | | Predicted metal-dependent hydrolase | | |
| 0173 | 169255 | 170073 | - | 272 | HisF | Imidazoleglycerol-phosphate synthase | COG0107 | [E] |
| 0174 | 170173 | 170856 | + | 227 | | Uncharacterized conserved protein | COG2454 | [S] |
| 0175 | 170934 | 171410 | + | 158 | TroR | Mn-dependent transcriptional regulator | COG1321 | [K] |
| 0176 | 171517 | 171996 | + | 159 | | Uncharacterized protein | | |
| 0177 | 172421 | 172690 | + | 89 | | Predicted membrane protein | | |
| 0178 | 172865 | 174169 | - | 434 | | Coenzyme F420-reducing hydrogenase, alpha subunit | COG3259 | [C] |
| 0179 | 174173 | 175090 | - | 305 | | Coenzyme F420-reducing hydrogenase, gamma subunit | COG1941 | [C] |
| 0180 | 175215 | 175787 | + | 190 | CbiM | Cobalamin biosynthesis protein CbiM | COG0310 | [P] |
| 0181 | 175784 | 176476 | + | 230 | CbiQ | ABC-type cobalt transport system, permease component | COG0619 | [P] |
| 0182 | 176505 | 177311 | + | 268 | CbiO | ABC-type cobalt transport system, ATPase component | COG1122 | [P] |
| 0183 | 177298 | 177972 | + | 224 | | Protein similar to creatinine amidohydrolase | COG1402 | [R] |
| 0184 | 177969 | 178136 | + | 55 | | Uncharacterized protein | | |
| 0185 | 178176 | 178400 | + | 74 | | Uncharacterized protein | | |
| 0186 | 178822 | 179454 | + | 210 | RnhB | Ribonuclease HII | COG0164 | [L] |
| 0187 | 179476 | 180135 | + | 219 | | Pyruvate-formate lyase-activating enzyme | COG1180 | [O] |
| 0188 | 180142 | 181521 | + | 459 | Tgt | Queuine/archaeosine tRNA-ribosyltransferase | COG0343 | [J] |
| 0189 | 181481 | 182362 | + | 293 | TRM1_2 | N2,N2-dimethylguanosine tRNA methyltransferase | COG1867 | [J] |
| 0190 | 182418 | 184016 | + | 532 | | Uncharacterized protein conserved in archaea | COG1892 | [S] |
| 0191 | 184291 | 185067 | - | 258 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|-----------|---|---------------------|------------------|
| 0192 | 185064 | 187520 | - | 818 | ChlI/ChlD | Mg-chelatase subunit ChlI and ChlD (MoxR-like ATPase and vWF domain) similar to subunits of a Ni-chelatase for the biosynthesis of the Ni-containing coenzyme F430, which is essential for the production of methane in methanogens | COG 1239 & COG 1240 | [H][H] |
| 0193 | 187517 | 188218 | - | 233 | Nth_1 | Predicted EndoIII-related endonuclease | COG 0177 | [L] |
| 0194 | 188360 | 189619 | - | 419 | | HD superfamily phosphohydrolase | COG 1078 | [R] |
| 0195 | 189564 | 190313 | - | 249 | | Uncharacterized conserved protein | COG 2457 | [S] |
| 0196 | 190289 | 191185 | - | 298 | CitG_1 | Triphosphoribosyl-dephospho-CoA synthetase | COG 1767 | [H] |
| 0197 | 191179 | 191640 | - | 153 | PgpB | Membrane-associated phospholipid phosphatase | COG 0671 | [I] |
| 0198 | 191625 | 192632 | - | 335 | HemB | Delta-aminolevulinic acid dehydratase | COG 0113 | [H] |
| 0199 | 192583 | 193491 | + | 302 | | Uncharacterized protein | | |
| 0200 | 193462 | 194676 | - | 404 | HemA | Glutamyl-tRNA reductase | COG 0373 | [H] |
| 0201 | 194763 | 195011 | + | 82 | | Uncharacterized protein | | |
| 0202 | 195008 | 195703 | - | 231 | Mra1 | Uncharacterized conserved protein | COG 1756 | [S] |
| 0203 | 195719 | 196417 | + | 232 | | Predicted hydrolase of the HAD superfamily | COG 0561 | [R] |
| 0204 | 196414 | 197445 | + | 343 | RecJ_1 | Single-stranded DNA-specific exonuclease | COG 0608 | [L] |
| 0205 | 197414 | 199021 | - | 535 | PyrG | CTP synthase (UTP-ammonia lyase) | COG 0504 | [F] |
| 0206 | 199348 | 200073 | + | 241 | | Uncharacterized protein conserved in archaea | COG 2122 | [S] |
| 0207 | 200076 | 200687 | - | 203 | | Predicted GTPase of the YihA family | COG 0218 | [R] |
| 0208 | 200743 | 200916 | - | 57 | | Preprotein translocase subunit Sec61beta | COG 4023 | [U] |
| 0209 | 201121 | 201396 | + | 91 | | Uncharacterized protein | | |
| 0210 | 201559 | 202800 | - | 413 | | Diverged homolog of ATP-dependent DNA ligase (eukaryotic ligase III) | | |
| 0211 | 202797 | 203468 | - | 223 | | Uncharacterized protein conserved in archaea | COG 4024 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0212 | 203539 | 204414 | - | 291 | | Uncharacterized membrane protein, conserved in archaea | COG4025 | [S] |
| 0213 | 204416 | 205297 | - | 293 | | Predicted hydrolase of the metallo-beta-lactamase superfamily | COG2248 | [R] |
| 0214 | 205420 | 205839 | - | 139 | | Predicted metal-dependent protease of the PAD1/JAB1 superfamily | COG1310 | [R] |
| 0215 | 205772 | 206662 | - | 296 | | Predicted membrane protein | | |
| 0216 | 206731 | 207078 | + | 115 | | Predicted regulator of Ras-like GTPase activity, member of the Roadblock/LC7/MglB family | COG2018 | [R] |
| 0217 | 207252 | 207995 | + | 247 | | Uncharacterized protein | | |
| 0218 | 207997 | 208806 | + | 269 | | ATPase involved in chromosome partitioning | COG0455 | [D] |
| 0219 | 208803 | 209303 | - | 166 | | Predicted RNA-binding protein containing PUA domain | COG2016 | [J] |
| 0220 | 209340 | 209561 | + | 73 | LSM1 | Small nuclear ribonucleoprotein (snRNP) homolog | COG1958 | [K] |
| 0221 | 209582 | 209770 | + | 62 | RPL37A | Ribosomal protein L37E | COG2126 | [J] |
| 0222 | 209784 | 210659 | + | 291 | | TOPRIM-domain-containing protein, potential nuclease | COG4026 | [R] |
| 0223 | 210649 | 211632 | + | 327 | PepP | Xaa-Pro aminopeptidase | COG0006 | [E] |
| 0224 | 211590 | 212726 | + | 378 | CobT | NaMN:DMB phosphoribosyltransferase | COG2038 | [H] |
| 0225 | 212723 | 213457 | - | 244 | | Uncharacterized membrane protein specific for M.kandleri, MK-4 family | | |
| 0226 | 213461 | 214513 | - | 350 | HypD | Hydrogenase maturation factor | COG0409 | [O] |
| 0227 | 214461 | 214739 | - | 92 | HypC | Hydrogenase maturation factor | COG0298 | [O] |
| 0228 | 214814 | 215236 | + | 140 | | Uncharacterized conserved protein | COG1371 | [S] |
| 0229 | 215254 | 216432 | + | 392 | | Archaea-specific pyridoxal phosphate-dependent enzyme | COG1103 | [R] |
| 0230 | 216609 | 217232 | + | 207 | | Predicted RNA methylase | | |
| 0231 | 217222 | 217764 | - | 180 | | Predicted transcriptional regulator | COG1318 | [K] |
| 0232 | 217843 | 218598 | + | 251 | | Predicted metal-dependent hydrolase of the TIM-barrel fold | COG1099 | [R] |
| 0233 | 218648 | 219319 | + | 223 | | Predicted dinucleotide-binding enzyme | COG2085 | [R] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|-------------------|------------------|
| 0234 | 219392 | 220681 | + | 429 | UbiD | Predicted decarboxylase related 3-polyprenyl-4-hydroxybenzoate decarboxylase | COG0043 | [H] |
| 0235 | 220673 | 221713 | - | 346 | PurA | Adenylosuccinate synthase | COG0104 | [F] |
| 0236 | 221605 | 223494 | - | 629 | | Uncharacterized protein | | |
| 0237 | 223440 | 225296 | - | 618 | | Uncharacterized secreted protein | | |
| 0238 | 225321 | 226688 | + | 455 | GatA | Asp-tRNA ^{Asn} /Glu-tRNA ^{Gln} amidotransferase A subunit | COG0154 | [J] |
| 0239 | 227527 | 227967 | + | 146 | | Predicted SAM-dependent methyltransferase | COG0500 | [QR] |
| 0240 | 228106 | 228978 | - | 290 | | ATPase involved in chromosome partitioning | COG0489 | [D] |
| 0241 | 229171 | 230037 | - | 288 | | Uncharacterized membrane protein, conserved in archaea | | |
| 0242 | 230076 | 231260 | + | 394 | | Predicted membrane protein | | |
| 0243 | 231242 | 232369 | - | 375 | | Fe-S oxidoreductase, related to NifB/MoaA family | COG1625 | [C] |
| 0244 | 232648 | 234678 | - | 676 | | Distinct Superfamily II helicase family with a unique C-terminal domain including a metal-binding cysteine cluster | COG1205 | [R] |
| 0245 | 234728 | 235990 | + | 420 | CysH | 3'-phosphoadenosine 5'-phosphosulfate sulfotransferase (PAPS reductase)/FAD synthetase fused to uncharacterized archaeal protein | COG4027 & COG0175 | [S][E][H] |
| 0246 | 236115 | 236423 | - | 102 | RpsJ | Ribosomal protein S10 | COG0051 | [J] |
| 0247 | 236467 | 237738 | - | 423 | | Translation elongation factor EF-1alpha (GTPase) | COG5256 | [J] |
| 0248 | 237821 | 238774 | - | 317 | | Predicted dehydrogenase | COG0673 | [R] |
| 0249 | 238965 | 240974 | - | 669 | HdrA_1 | Heterodisulfide reductase, subunit A | COG1148 | [C] |
| 0250 | 241089 | 241838 | - | 249 | | Uncharacterized protein | | |
| 0251 | 241914 | 242435 | + | 173 | RplP | Ribosomal protein L16/L10E | COG0197 | [J] |
| 0252 | 242469 | 244781 | + | 770 | PpsA | Phosphoenolpyruvate synthase/pyruvate phosphate dikinase | COG0574 | [G] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0253 | 244787 | 245512 | + | 241 | | Predicted transcriptional regulator | COG1378 | [K] |
| 0254 | 245475 | 245990 | - | 171 | | Predicted HD superfamily hydrolase | COG1418 | [R] |
| 0255 | 246012 | 246296 | - | 94 | EFB1 | Translation elongation factor EF-1beta | COG2092 | [J] |
| 0256 | 246301 | 246495 | - | 64 | | Predicted Zn-ribbon-containing RNA-binding protein with a function in translation | COG2888 | [J] |
| 0257 | 246666 | 246899 | - | 77 | | Predicted redox protein, regulator of disulfide bond formation | COG0425 | [O] |
| 0258 | 247069 | 248334 | + | 421 | HgdB | Benzoyl-CoA reductase/2-hydroxyglutaryl-CoA dehydratase subunit, BcrC/BadD/HgdB | COG1775 | [E] |
| 0259 | 248342 | 249646 | - | 434 | FwdB_1 | Formylmethanofuran dehydrogenase subunit B | COG1029 | [C] |
| 0260 | 249749 | 250504 | - | 251 | | Activator of 2-hydroxyglutaryl-CoA dehydratase, contains a HSP70-class ATPase domain | COG1924 | [I] |
| 0261 | 250695 | 251156 | + | 153 | | Uncharacterized membrane protein, conserved in archaea | | |
| 0262 | 251171 | 251644 | + | 157 | | Predicted transporter component | COG2391 | [R] |
| 0263 | 251649 | 252227 | + | 192 | | Uncharacterized protein conserved in archaea | | |
| 0264 | 252347 | 253048 | + | 233 | | Predicted sugar kinase | COG0063 | [G] |
| 0265 | 253054 | 255024 | - | 656 | HdrA_2 | Heterodisulfide reductase, subunit A, polyferredoxin | COG1148 | [C] |
| 0266 | 255031 | 256479 | - | 482 | | Coenzyme F420-reducing hydrogenase, alpha subunit | COG3259 | [C] |
| 0267 | 256476 | 257390 | - | 304 | | Coenzyme F420-reducing hydrogenase, gamma subunit | COG1941 | [C] |
| 0268 | 257387 | 257812 | - | 141 | FlpD_1 | Coenzyme F420-reducing hydrogenase, delta subunit | COG1908 | [C] |
| 0269 | 257952 | 259379 | + | 475 | | Predicted membrane protein | | |
| 0270 | 259341 | 259781 | - | 146 | | Uncharacterized conserved protein | COG1617 | [S] |
| 0271 | 260022 | 261596 | + | 524 | PheS | Phenylalanyl-tRNA synthetase alpha subunit | COG0016 | [J] |
| 0272 | 261597 | 262133 | - | 178 | | Uncharacterized protein | | |
| 0273 | 262262 | 262552 | + | 96 | | Uncharacterized conserved protein | COG1872 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|--|----------------|------------------|
| 0274 | 263009 | 263827 | + | 272 | | Uncharacterized protein | | |
| 0275 | 263828 | 265357 | - | 509 | | Isopropylmalate/homocitrate/citramalate synthase homolog | COG0119 | [E] |
| 0276 | 265405 | 266217 | - | 270 | | Predicted P-loop ATPase/GTPase | COG4028 | [R] |
| 0277 | 266246 | 266977 | + | 243 | | Predicted Fe-S oxidoreductase | COG5014 | [R] |
| 0278 | 266967 | 268979 | + | 670 | | Predicted membrane protein, family MK-41 family | | |
| 0279 | 269014 | 271053 | + | 679 | | Predicted membrane protein, family MK-41 family | | |
| 0280 | 271207 | 272499 | - | 430 | HemL | Glutamate-1-semialdehyde aminotransferase | COG0001 | [H] |
| 0281 | 272912 | 273337 | - | 141 | RibH | Riboflavin synthase beta-chain | COG0054 | [H] |
| 0282 | 273412 | 274092 | + | 226 | Pcm | Protein-L-isoaspartate carboxylmethyltransferase | COG2518 | [O] |
| 0283 | 274537 | 274878 | + | 113 | | Uncharacterized protein conserved in archaea | COG4043 | [S] |
| 0284 | 275404 | 276174 | - | 256 | | Metal-dependent hydrolases of the beta-lactamase superfamily I | COG1235 | [R] |
| 0285 | 276198 | 277166 | - | 322 | | Uncharacterized protein conserved in archaea | COG4079 | [S] |
| 0286 | 277208 | 278248 | - | 346 | | Pyruvate-formate lyase-activating enzyme | COG1180 | [O] |
| 0287 | 278245 | 278508 | - | 87 | PaaD | Predicted metal-sulfur cluster biosynthetic enzyme (MinD N-terminal domain family) | COG2151 | [R] |
| 0288 | 278515 | 278901 | - | 128 | | Flavodoxins | COG0716 | [C] |
| 0289 | 278976 | 280052 | - | 358 | RgyA | Reverse gyrase, subunit A | COG1110 | [L] |
| 0290 | 280321 | 280542 | + | 73 | | Uncharacterized protein | | |
| 0291 | 280561 | 281142 | - | 193 | DCD-DUT | Deoxycytidine deaminase/diphosphatase | COG0717 | [F] |
| 0292 | 281158 | 282030 | + | 290 | | Predicted phosphohydrolase | COG1409 | [R] |
| 0293 | 282024 | 282554 | - | 176 | | Uncharacterized conserved protein | COG1641 | [S] |
| 0294 | 282582 | 283844 | + | 420 | | Uncharacterized membrane protein | COG3174 | [S] |
| 0295 | 283841 | 285190 | - | 449 | | tRNA/rRNA cytosine-C5-methylase | COG0144 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|--|----------------|------------------|
| 0296 | 285197 | 285631 | - | 144 | | Predicted diguamylate cyclase, diverged member of the GGDEF superfamily | | |
| 0297 | 285628 | 287196 | - | 522 | | Phosphoglycerate dehydrogenase and related dehydrogenases | COG0111 | [E] |
| 0298 | 287326 | 287943 | - | 205 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 0299 | 288089 | 289126 | - | 345 | | Uncharacterized secreted protein specific for M.kandleri, MK-3 family | | |
| 0300 | 289372 | 290193 | - | 273 | | Uncharacterized protein | | |
| 0301 | 290810 | 291202 | + | 130 | | Predicted RNA-binding protein containing PIN domain, a fragment | | |
| 0302 | 291417 | 292477 | + | 353 | | Predicted RNA-binding protein containing PIN domain, a fragment | | |
| 0303 | 292704 | 293645 | + | 313 | | Predicted cysteine protease of the transglutaminase-like superfamily | COG1305 | [E] |
| 0304 | 293608 | 294210 | + | 200 | | Uncharacterized protein | | |
| 0305 | 294271 | 295311 | + | 346 | | Uncharacterized protein | | |
| 0306 | 295669 | 296193 | + | 174 | | Uncharacterized protein | | |
| 0307 | 296467 | 297540 | + | 357 | Fwd F_1 | Probable formylmethanofuran dehydrogenase subunit F, ferredoxin containing | COG1145 | [C] |
| 0308 | 297654 | 298370 | - | 238 | | Uncharacterized protein | | |
| 0309 | 298367 | 299332 | - | 321 | | ATPase involved in chromosome partitioning | COG1192 | [D] |
| 0310 | 299623 | 300867 | - | 414 | | Orphan DOD family homing endonuclease | COG1372 | [L] |
| 0311 | 302118 | 302261 | - | 47 | | Uncharacterized protein | | |
| 0312 | 302397 | 303113 | + | 238 | | Uncharacterized protein specific for M.kandleri, MK-42 family | | |
| 0313 | 303210 | 303731 | + | 173 | | Uncharacterized protein specific for M.kandleri, MK-22 family | | |
| 0314 | 304168 | 305175 | + | 335 | Foc A | Transporter of the formate/nitrite transporter family | COG2116 | [P] |
| 0315 | 306790 | 307817 | + | 342 | | Predicted hydrolase of the metallo-beta-lactamase superfamily, a fragment | COG0595 | [R] |
| 0316 | 307991 | 308224 | + | 77 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|----------------|------------------|
| 0317 | 309026 | 309403 | - | 125 | | Adenine-specific DNA methylase containing a Zn-ribbon | COG1743 | [L] |
| 0318 | 309400 | 310002 | - | 200 | | Adenine-specific DNA methylase containing a Zn-ribbon | COG1743 | [L] |
| 0319 | 310314 | 310514 | - | 66 | | Phosphoglycerate dehydrogenase and related dehydrogenases | COG0111 | [E] |
| 0320 | 310502 | 311260 | - | 252 | SerA | Phosphoglycerate dehydrogenase and related dehydrogenases | COG0111 | [E] |
| 0321 | 311717 | 313774 | + | 685 | FdhA | Selenocysteine-containing anaerobic formate dehydrogenase, subunit alpha | COG0243 | [C] |
| 0322 | 313780 | 314913 | + | 377 | | Coenzyme F420-reducing hydrogenase, beta subunit | COG1035 | [C] |
| 0323 | 315226 | 315678 | + | 150 | Fwd_F2 | Probable formylmethanofuran dehydrogenase subunit F, ferredoxin containing | COG1145 | [C] |
| 0324 | 315855 | 316253 | - | 132 | | Fragment of predicted dehydrogenase related to phosphoglycerate dehydrogenase | | |
| 0325 | 316385 | 316765 | - | 126 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 0326 | 316791 | 318491 | + | 566 | | Uncharacterized protein specific for M.kandleri, MK-5 family | | |
| 0327 | 318525 | 319349 | + | 274 | | Predicted membrane protein | | |
| 0328 | 319527 | 320099 | + | 190 | | Predicted membrane protein | | |
| 0329 | 320696 | 321142 | + | 148 | | Predicted membrane protein | | |
| 0330 | 321611 | 322570 | - | 319 | | Uncharacterized secreted protein specific for M.kandleri, MK-30 family | | |
| 0331 | 323201 | 323818 | + | 205 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 0332 | 324061 | 324486 | - | 141 | | Uncharacterized protein conserved in archaea | COG4029 | [S] |
| 0333 | 324530 | 325426 | + | 298 | ThrB | Homoserine kinase | COG0083 | [E] |
| 0334 | 325541 | 326770 | - | 409 | CbiD | Cobalamin biosynthesis protein CbiD | COG1903 | [H] |
| 0335 | 326767 | 327753 | - | 328 | GCN3 | Translation initiation factor eIF-2B alpha subunit | COG0182 | [J] |
| 0336 | 327856 | 328425 | + | 189 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|-------------------|------------------|
| 0337 | 328419 | 329402 | - | 327 | | Predicted transcriptional regulator consisting of wHTH DNA-binding domain and an uncharacterized domain conserved in archaea | COG1693 | [S] |
| 0338 | 329455 | 330930 | - | 491 | GlnA | Glutamine synthetase | COG0174 | [E] |
| 0339 | 330946 | 332115 | + | 389 | | Predicted membrane protein | | |
| 0340 | 332123 | 333190 | - | 355 | | Predicted Fe-S oxidoreductase | COG1244 | [R] |
| 0341 | 333200 | 333739 | + | 179 | SEN2_1 | tRNA splicing endonuclease | COG1676 | [J] |
| 0342 | 333753 | 333998 | + | 81 | | Predicted transcriptional regulator containing DNA-binding HTH domain | | |
| 0343 | 334027 | 335151 | + | 374 | TrpS | Tryptophanyl-tRNA synthetase | COG0180 | [J] |
| 0344 | 335153 | 336226 | + | 357 | | Predicted 23S rRNA methylase containing THUMP domain | COG1818 & COG0293 | [R][J] |
| 0345 | 336446 | 336976 | + | 176 | | Uncharacterized protein | | |
| 0346 | 336954 | 337934 | + | 326 | | Uncharacterized protein conserved in archaea | COG4030 | [S] |
| 0347 | 337941 | 339344 | - | 467 | | Predicted ABC-type ATPase | COG3044 | [R] |
| 0348 | 339352 | 339930 | - | 192 | | Uncharacterized protein | | |
| 0349 | 339944 | 340672 | - | 242 | | Uncharacterized protein | | |
| 0350 | 340738 | 340962 | + | 74 | | Uncharacterized protein conserved in archaea | COG1531 | [S] |
| 0351 | 340922 | 341869 | - | 315 | | Predicted DNA-binding protein containing a Zn-ribbon | COG1571 | [R] |
| 0352 | 341898 | 342389 | + | 163 | | Uncharacterized protein | | |
| 0353 | 342379 | 343095 | - | 238 | | Uncharacterized domain conserved in archaea fused to a metal-binding domain | COG4031 | [R] |
| 0354 | 343122 | 343445 | + | 107 | | Uncharacterized protein | | |
| 0355 | 343442 | 344674 | - | 410 | HMG1 | Hydroxymethylglutaryl-CoA reductase | COG1257 | [I] |
| 0356 | 345316 | 345639 | - | 107 | | Predicted membrane protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|---------------------|------------------|
| 0357 | 345630 | 346286 | - | 218 | | Peroxiredoxin, predicted regulator of disulfide bond formation | COG 0425 & COG 2044 | [O][R] |
| 0358 | 346686 | 347828 | - | 380 | | Ferredoxin fused to an uncharacterized conserved domain | COG 1900 & COG 1146 | [S][C] |
| 0359 | 348126 | 348380 | - | 84 | GatC | Asp-tRNA ^{Asn} /Glu-tRNA ^{Gln} amidotransferase C subunit | COG 0721 | [J] |
| 0360 | 348428 | 349369 | - | 313 | AmpS | Leucyl aminopeptidase (aminopeptidase T) | COG 2309 | [E] |
| 0361 | 349585 | 350058 | - | 157 | | Archaeal riboflavin synthase | COG 1731 | [H] |
| 0362 | 350055 | 351050 | - | 331 | | Predicted metal-binding protein, conserved in archaea | | |
| 0363 | 351081 | 352025 | + | 314 | GuaA 1 | PP-ATPase subunit of GMP synthase | COG 0519 | [F] |
| 0364 | 352038 | 352766 | + | 242 | HisA | Phosphoribosylformimino-5-aminoimidazole carboxamide ribonucleotide (ProFAR) isomerase | COG 0106 | [E] |
| 0365 | 352763 | 353614 | - | 283 | HisG | ATP phosphoribosyltransferase | COG 0040 | [E] |
| 0366 | 353673 | 354968 | + | 431 | | Predicted metal-dependent hydrolase related to cytosine deaminase | COG 0402 | [FR] |
| 0367 | 355449 | 356759 | - | 436 | | Uncharacterized protein conserved in archaea | | |
| 0368 | 356998 | 358272 | + | 424 | | S-adenosylhomocysteine hydrolase | COG 0499 | [H] |
| 0369 | 358478 | 358597 | + | 39 | | Uncharacterized protein | | |
| 0370 | 359581 | 360552 | + | 323 | | tRNA/rRNA cytosine-C5-methylase | COG 0144 | [J] |
| 0371 | 360613 | 361065 | + | 150 | | Uncharacterized protein | | |
| 0372 | 361116 | 362186 | - | 356 | MurG | UDP-N-acetylglucosamine:LPS N-acetylglucosamine transferase | COG 0707 | [M] |
| 0373 | 362211 | 363419 | + | 402 | | Predicted GTPase, probable translation factor | COG 0012 | [J] |
| 0374 | 363447 | 363887 | + | 146 | | Uncharacterized protein | | |
| 0375 | 364113 | 364475 | - | 120 | GimC | Prefoldin, chaperonin cofactor | COG 1382 | [O] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|----------------|------------------|
| 0376 | 364476 | 364727 | - | 83 | | Uncharacterized protein conserved in archaea | COG2892 | [S] |
| 0377 | 364743 | 365321 | - | 192 | IMP4 | Predicted exosome subunit containing the IMP4 domain present in small nuclear ribonucleoprotein | COG2136 | [J] |
| 0378 | 365318 | 365473 | - | 51 | RPC10 | DNA-directed RNA polymerase subunit RPC10 (contains C4-type Zn-finger) | COG1996 | [K] |
| 0379 | 365476 | 365745 | - | 89 | RPL43A | Ribosomal protein L37AE/L43A | COG1997 | [J] |
| 0380 | 365802 | 366605 | - | 267 | | Predicted exosome subunit, predicted exoribonuclease related to RNase PH | COG2123 | [J] |
| 0381 | 366607 | 367326 | - | 239 | Rph | Predicted exosome subunit, RNase PH | COG0689 | [J] |
| 0382 | 367335 | 368054 | - | 239 | RRP4 | Predicted exosome subunit, RNA-binding protein Rrp4 (contain S1 domain and KH domain) | COG1097 | [J] |
| 0383 | 368062 | 369129 | - | 355 | | Predicted hydrolase related to cellulase M | COG1363 | [G] |
| 0384 | 369130 | 369852 | - | 240 | | Predicted exosome subunit | COG1500 | [J] |
| 0385 | 369855 | 370595 | - | 246 | HsIV1 | Protease subunit of the proteasome | COG0638 | [O] |
| 0386 | 370595 | 371089 | - | 164 | POP5 | Predicted exosome subunit, RNase P subunit P14 | COG1369 | [J] |
| 0387 | 371086 | 371820 | - | 244 | RPP30 | Ribonuclease P subunit Rpp30 | COG1603 | [J] |
| 0388 | 371817 | 372278 | - | 153 | | Predicted exosome subunit | COG1325 | [J] |
| 0389 | 372312 | 372905 | - | 197 | RPL15A | Ribosomal protein L15E | COG1632 | [J] |
| 0390 | 372970 | 373710 | - | 246 | | Predicted HD-superfamily hydrolase | COG3481 | [R] |
| 0391 | 373774 | 375273 | + | 499 | | Isopropylmalate synthase | COG0119 | [E] |
| 0392 | 375270 | 376295 | - | 341 | ComC | L-sulfolactate dehydrogenase | COG2055 | [C] |
| 0393 | 376299 | 376865 | - | 188 | ComE | Sulfolpyruvate decarboxylase, beta subunit | COG0028 | [EH] |
| 0394 | 376933 | 377703 | + | 256 | ComA | (2R)-phospho-3-sulfolactate synthase (PSL synthase) | COG1809 | [S] |
| 0395 | 377707 | 378210 | + | 167 | ComD | Sulfolpyruvate decarboxylase, alpha subunit | COG4032 | [R] |
| 0396 | 378195 | 379127 | - | 310 | | SAM-dependent methyltransferase | COG0500 | [QR] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|---|----------------|------------------|
| 0397 | 379182 | 379682 | - | 166 | SEN2_2 | tRNA splicing endonuclease | COG1676 | [J] |
| 0398 | 379633 | 379872 | - | 79 | | Ribosomal protein S4 and related proteins | COG0522 | [J] |
| 0399 | 379869 | 380348 | - | 159 | | Uncharacterized protein conserved in archaea | COG1931 | [S] |
| 0400 | 380305 | 380895 | - | 196 | CoaE | Dephospho-CoA kinase | COG0237 | [H] |
| 0401 | 380949 | 382022 | - | 357 | | Uncharacterized conserved protein | COG1415 | [S] |
| 0402 | 382222 | 383223 | + | 333 | | Predicted RNA-binding protein containing THUMP domain | COG1818 | [R] |
| 0403 | 383306 | 384133 | + | 275 | TrpA | Tryptophan synthase alpha chain | COG0159 | [E] |
| 0404 | 385121 | 386080 | - | 319 | ECM27_1 | Ca ²⁺ /Na ⁺ antiporter | COG0530 | [P] |
| 0405 | 386095 | 386403 | + | 102 | | Zn-ribbon-containing protein | | |
| 0406 | 386375 | 386872 | + | 165 | MobA | Molybdopterin-guanine dinucleotide biosynthesis protein A | COG0746 | [H] |
| 0407 | 386862 | 388859 | - | 665 | | Uncharacterized protein conserved in archaea | COG2433 | [S] |
| 0408 | 388923 | 389306 | + | 127 | | Uncharacterized membrane protein/domain | COG1714 | [S] |
| 0409 | 389293 | 389832 | - | 179 | | Predicted intracellular protease/amidase | COG0693 | [R] |
| 0410 | 389846 | 390271 | + | 141 | | Uncharacterized protein conserved in archaea | COG4081 | [S] |
| 0411 | 390268 | 390561 | + | 97 | | Uncharacterized protein conserved in archaea | COG4033 | [S] |
| 0412 | 390558 | 391289 | - | 243 | RplB | Ribosomal protein L2 | COG0090 | [J] |
| 0413 | 391302 | 391589 | - | 95 | RplW | Ribosomal protein L23 | COG0089 | [J] |
| 0414 | 391593 | 392375 | - | 260 | RplD | Ribosomal protein L4 | COG0088 | [J] |
| 0415 | 392390 | 393475 | - | 361 | RplC | Ribosomal protein L3 | COG0087 | [J] |
| 0416 | 393619 | 394368 | + | 249 | | Uncharacterized protein | | |
| 0417 | 394373 | 394654 | + | 93 | RPL42A | Ribosomal protein L44E | COG1631 | [J] |
| 0418 | 394669 | 394890 | + | 73 | RPS27A | Ribosomal protein S27E | COG2051 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|------|--|----------------|------------------|
| 0419 | 394890 | 395693 | + | 267 | SUI2 | Translation initiation factor eIF2-alpha | COG1093 | [J] |
| 0420 | 395697 | 395897 | + | 66 | | Predicted Zn-ribbon-containing RNA-binding protein | COG2260 | [J] |
| 0421 | 395901 | 396710 | + | 269 | | Uncharacterized enzyme of the ATP-grasp superfamily | COG2047 | [R] |
| 0422 | 397017 | 397583 | + | 188 | | Uncharacterized membrane protein | | |
| 0423 | 397587 | 398081 | + | 164 | | Uncharacterized membrane protein, conserved in archaea | COG4083 | [S] |
| 0424 | 398083 | 399336 | + | 417 | | Uncharacterized conserved protein | COG1379 | [S] |
| 0425 | 399333 | 400784 | + | 483 | | Predicted metal-dependent hydrolase of the TIM-barrel fold | | |
| 0426 | 400786 | 401517 | + | 243 | | Predicted metal-dependent hydrolase of the TIM-barrel fold | COG2159 | [R] |
| 0427 | 401719 | 402249 | + | 176 | | Uncharacterized conserved protein | | |
| 0428 | 402254 | 402685 | + | 143 | | Uncharacterized conserved protein | COG2138 | [S] |
| 0429 | 402699 | 403346 | + | 215 | AroD | 3-dehydroquinate dehydratase | COG0710 | [E] |
| 0430 | 403335 | 404072 | - | 245 | | Flavoprotein involved in thiazole biosynthesis | COG1635 | [H] |
| 0431 | 404095 | 404466 | - | 123 | | Uncharacterized protein conserved in archaea | | |
| 0432 | 404463 | 404834 | - | 123 | | Uncharacterized protein | | |
| 0433 | 404865 | 405650 | - | 261 | SurE | Predicted acid phosphatase | COG0496 | [R] |
| 0434 | 405568 | 406407 | - | 279 | DapF | Diaminopimelate epimerase | COG0253 | [E] |
| 0435 | 406436 | 407173 | - | 245 | DapD | Tetrahydrodipicolinate N-succinyltransferase | COG2171 | [E] |
| 0436 | 407170 | 407748 | - | 192 | PabA | Anthranilate/para-aminobenzoate synthase component II | COG0512 | [EH] |
| 0437 | 407723 | 409129 | - | 468 | TrpE | Anthranilate/para-aminobenzoate synthase component I | COG0147 | [EH] |
| 0438 | 409120 | 409710 | - | 196 | | Uncharacterized membrane protein | COG1300 | [S] |
| 0439 | 409925 | 411559 | - | 544 | | Phenylalanyl-tRNA synthetase alpha subunit, archaeal type | COG2024 | [J] |
| 0440 | 411681 | 412184 | + | 167 | | Uncharacterized protein | | |
| 0441 | 412195 | 412410 | + | 71 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|--|----------------|------------------|
| 044 2 | 412 377 | 413 771 | + | 464 | | Uncharacterized protein | | |
| 044 3 | 413 745 | 414 398 | - | 217 | | Predicted RNA-binding protein of the translin family | COG 2178 | [J] |
| 044 4 | 414 419 | 415 777 | - | 452 | | tRNA/rRNA cytosine-C5-methylase | COG 0144 | [J] |
| 044 5 | 415 803 | 416 762 | + | 319 | | Uncharacterized protein conserved in archaea | COG 4034 | [S] |
| 044 6 | 416 913 | 417 761 | + | 282 | Nad C | Nicotinate-nucleotide pyrophosphorylase | COG 0157 | [H] |
| 044 7 | 417 779 | 418 756 | - | 325 | | Uncharacterized protein | | |
| 044 8 | 418 732 | 419 226 | - | 164 | IlvB 1 | Acetolactate synthase large subunit | COG 0028 | [EH] |
| 044 9 | 419 733 | 420 248 | + | 171 | | Predicted transcription factor, homolog of eukaryotic MBF1 | COG 1813 | [K] |
| 045 0 | 420 252 | 420 827 | - | 191 | | Uncharacterized protein | | |
| 045 1 | 420 814 | 422 439 | - | 541 | FtsA | Actin-like ATPase involved in cell division | COG 0849 | [D] |
| 045 2 | 422 444 | 422 755 | - | 103 | | Predicted pyrophosphatase | COG 1694 | [R] |
| 045 3 | 422 752 | 423 300 | - | 182 | | SAM-dependent methyltransferase | COG 0500 | [QR] |
| 045 4 | 423 263 | 423 655 | - | 130 | | Uncharacterized protein conserved in archaea | COG 1844 | [S] |
| 045 5 | 423 708 | 424 130 | + | 140 | | Uncharacterized protein conserved in archaea | COG 4921 | [S] |
| 045 6 | 424 099 | 425 370 | + | 423 | | GTPase of the HflX family | COG 2262 | [R] |
| 045 7 | 425 367 | 425 804 | - | 145 | | Predicted transcription regulator containing the wHTH DNA-binding domain | | |
| 045 8 | 425 875 | 426 513 | - | 212 | | FOG: CBS domain | COG 0517 | [R] |
| 045 9 | 426 513 | 427 271 | - | 252 | | Ferredoxin | COG 1145 | [C] |
| 046 0 | 427 268 | 427 711 | - | 147 | Eha P | Ferredoxin | COG 1145 | [C] |
| 046 1 | 427 686 | 428 825 | - | 379 | Ehb K | Ferredoxin | COG 1145 | [C] |
| 046 2 | 428 829 | 429 407 | - | 192 | Eha Q | Ferredoxin | COG 1145 | [C] |
| 046 3 | 429 389 | 430 618 | - | 409 | Eha O | Ni,Fe-hydrogenase III large subunit | COG 3261 | [C] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|------|---|-------------------|------------------|
| 0464 | 430599 | 431087 | - | 162 | EhaN | Ni,Fe-hydrogenase III small subunit | COG3260 | [C] |
| 0465 | 431084 | 431524 | - | 146 | EhaM | Uncharacterized protein conserved in archaea | COG4084 | [S] |
| 0466 | 431521 | 431865 | - | 114 | EhaL | Uncharacterized membrane protein, conserved in archaea | COG4035 | [S] |
| 0467 | 431862 | 432101 | - | 79 | | Uncharacterized protein | | |
| 0468 | 432112 | 432963 | - | 283 | EhaJ | Membrane protein related to formate hydrogenlyase subunit 4 | COG0650 | [C] |
| 0469 | 432967 | 433170 | - | 67 | | Uncharacterized protein | | |
| 0470 | 433183 | 433854 | - | 223 | EhaH | Uncharacterized membrane protein, conserved in archaea | COG4078 | [S] |
| 0471 | 433838 | 434515 | - | 225 | EhaG | Uncharacterized membrane protein, conserved in archaea | COG4036 | [S] |
| 0472 | 434512 | 435021 | - | 169 | EhaF | Uncharacterized membrane protein, conserved in archaea | COG4037 | [S] |
| 0473 | 434978 | 435265 | - | 95 | EhaE | Uncharacterized membrane protein, conserved in archaea | COG4038 | [S] |
| 0474 | 435258 | 435500 | - | 80 | EhaD | Uncharacterized membrane protein, conserved in archaea | COG4039 | [S] |
| 0475 | 435497 | 435760 | - | 87 | EhaC | Uncharacterized membrane protein, conserved in archaea | COG4040 | [S] |
| 0476 | 435757 | 436278 | - | 173 | EhaB | Uncharacterized membrane protein, conserved in archaea | COG4041 | [S] |
| 0477 | 436275 | 436568 | - | 97 | EhaA | Uncharacterized membrane protein, conserved in archaea | COG4042 | [S] |
| 0478 | 436592 | 437665 | + | 357 | | Predicted ATPase, MoxR-like family of the AAA+ class | COG0714 | [R] |
| 0479 | 438675 | 440018 | + | 447 | | Uncharacterized protein containing a von Willebrand factor type A (vWA) domain | COG2425 | [R] |
| 0480 | 440015 | 440614 | - | 199 | | Uncharacterized protein | | |
| 0481 | 440625 | 441635 | + | 336 | | Predicted NTPase | | |
| 0482 | 441586 | 442755 | - | 389 | | Predicted transcriptional regulators, consists of a molybdenum cofactor biosynthesis enzyme fused to a HTH DNA-binding domain | COG2896 & COG1522 | [H][K] |
| 0483 | 442817 | 444034 | - | 405 | LysA | Diaminopimelate decarboxylase | COG0019 | [E] |
| 0484 | 444079 | 444621 | - | 180 | | Uncharacterized protein conserved in archaea | COG4077 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|-------------------|------------------|
| 0485 | 444618 | 445595 | - | 325 | | Uncharacterized conserved protein | COG1469 | [S] |
| 0486 | 445677 | 449426 | + | 1249 | | ATPases of the AAA+ class & Intein/homing endonuclease | COG0464 & COG1372 | [O][L] |
| 0487 | 449457 | 449915 | + | 152 | | Uncharacterized conserved protein | COG1656 | [S] |
| 0488 | 449908 | 450531 | + | 207 | | Uncharacterized conserved protein | COG2078 | [S] |
| 0489 | 450514 | 451131 | - | 205 | | Uncharacterized proteins, LmbE homologs | COG2120 | [S] |
| 0490 | 451128 | 452138 | - | 336 | | Glycosyltransferase, probably involved in cell wall biogenesis | COG1215 | [M] |
| 0491 | 452156 | 453241 | - | 361 | CarA | Carbamoylphosphate synthase small subunit | COG0505 | [EF] |
| 0492 | 453622 | 454674 | + | 350 | | Archaea-specific enzyme related to ProFAR isomerase (HisA) and containing an additional uncharacterized domain | COG1411 & COG4043 | [R][S] |
| 0493 | 454678 | 455469 | - | 263 | | Uncharacterized protein conserved in archaea | COG4044 | [S] |
| 0494 | 455483 | 456004 | - | 173 | | Predicted HD superfamily hydrolase | COG1418 | [R] |
| 0495 | 456001 | 456582 | - | 193 | TFA1 | Transcription initiation factor IIE, large subunit | COG1675 | [K] |
| 0496 | 456587 | 457279 | - | 230 | | Uncharacterized protein | | |
| 0497 | 457283 | 459457 | - | 724 | PurL_2 | Phosphoribosylformylglycinamidine (FGAM) synthase, synthetase domain | COG0046 | [F] |
| 0498 | 459523 | 460449 | - | 308 | | Fe-S oxidoreductase | COG0247 | [C] |
| 0499 | 460425 | 461879 | - | 484 | | Predicted ribonuclease of the G/E family | COG1530 | [J] |
| 0500 | 461906 | 462208 | + | 100 | Hisl_1 | Phosphoribosyl-ATP pyrophosphohydrolase | COG0140 | [E] |
| 0501 | 462591 | 463937 | + | 448 | | Uncharacterized FAD-dependent dehydrogenase | COG2509 | [R] |
| 0502 | 463950 | 464894 | + | 314 | | Uncharacterized protein conserved in archaea | | |
| 0503 | 465077 | 466090 | + | 337 | | Predicted aminopeptidase | COG2234 | [R] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0504 | 466093 | 466626 | + | 177 | | Amidase related to nicotinamidase | COG1335 | [Q] |
| 0505 | 466623 | 467993 | + | 456 | cDPGS | Cyclic 2,3-diphosphoglycerate-synthetase | COG2403 | [R] |
| 0506 | 467990 | 468223 | - | 77 | HHT1_1 | Histone H3/H4 | COG2036 | [L] |
| 0507 | 468287 | 469069 | + | 260 | | Predicted nuclease of the RecB family | COG1637 | [L] |
| 0508 | 469072 | 469722 | + | 216 | TrpF | Phosphoribosylanthranilate isomerase | COG0135 | [E] |
| 0509 | 469706 | 473605 | - | 1299 | | Predicted protein of the CobN/Mg-chelataase family | COG1429 | [H] |
| 0510 | 473846 | 475135 | + | 429 | | Predicted Zn-dependent metalloproteinase | | |
| 0511 | 475141 | 476415 | + | 424 | | Terpene cyclase/mutase family protein | COG1657 | [I] |
| 0512 | 476375 | 477415 | - | 346 | Top6A | DNA topoisomerase VI, subunit A | COG1697 | [L] |
| 0513 | 477452 | 478060 | - | 202 | | Predicted RNA-binding protein containing KH domain) | COG1094 | [R] |
| 0514 | 478065 | 478856 | - | 263 | RIO1_1 | Serine/threonine protein kinase involved in cell cycle control | COG1718 | [TD] |
| 0515 | 478853 | 479188 | - | 111 | InfA | Translation initiation factor IF-1 | COG0361 | [J] |
| 0516 | 479449 | 480423 | - | 324 | TyrS | Tyrosyl-tRNA synthetase | COG0162 | [J] |
| 0517 | 480456 | 481520 | - | 354 | NMD3 | NMD protein affecting ribosome stability and mRNA decay | COG1499 | [J] |
| 0518 | 481521 | 482639 | - | 372 | | Uncharacterized protein conserved in archaea | COG4046 | [S] |
| 0519 | 483150 | 483854 | - | 234 | LasT | rRNA methylase | COG0565 | [J] |
| 0520 | 483880 | 485811 | + | 643 | | ABC-type ATPase fused to a predicted acetyltransferase domain | COG2401 | [R] |
| 0521 | 485808 | 486257 | - | 149 | | Universal stress protein UspA and related nucleotide-binding proteins | COG0589 | [T] |
| 0522 | 486337 | 486723 | + | 128 | | Zn-finger-containing protein | COG2158 | [R] |
| 0523 | 486677 | 487123 | - | 148 | | Uncharacterized protein conserved in archaea | COG4933 | [S] |
| 0524 | 487264 | 488313 | - | 349 | Mer | Coenzyme F420-dependent N5,N10-methylene tetrahydromethanopterin reductase | COG2141 | [C] |
| 0525 | 488504 | 489094 | + | 196 | | FOG: CBS domain | COG0517 | [R] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|-------|--|-------------------|------------------|
| 0526 | 489122 | 489958 | + | 278 | | FOG: CBS domain | COG0517 | [R] |
| 0527 | 489930 | 492113 | - | 727 | | Uncharacterized membrane protein specific for M.kandleri, MK-13 family | | |
| 0528 | 492151 | 493311 | + | 386 | | ATP-dependent DNA ligase, homolog of eukaryotic ligase III | COG1423 | [L] |
| 0529 | 493316 | 493792 | + | 158 | | Soluble P-type ATPase | COG4087 | [R] |
| 0530 | 493786 | 495066 | + | 426 | PyrC | Dihydroorotase | COG0044 | [F] |
| 0531 | 495059 | 496756 | + | 565 | IlvB2 | Acetolactate synthase, large subunit | COG0028 | [EH] |
| 0532 | 497119 | 497505 | + | 128 | | Rubrerythrin | COG1592 | [C] |
| 0533 | 497572 | 498342 | + | 256 | | Predicted metal-dependent hydrolase of the TIM-barrel fold | COG1099 | [R] |
| 0534 | 498533 | 499327 | + | 264 | | Uncharacterized protein conserved in archaea | COG1810 | [S] |
| 0535 | 499336 | 499764 | - | 142 | | Uncharacterized protein | | |
| 0536 | 499901 | 501817 | + | 638 | | 6Fe-6S prismane cluster-containing carbon monoxide dehydrogenase catalytic subunit | COG1151 | [C] |
| 0537 | 501838 | 502950 | + | 370 | | Coenzyme F420-reducing hydrogenase, alpha subunit | COG3259 | [C] |
| 0538 | 502964 | 503680 | + | 238 | | Coenzyme F420-reducing hydrogenase, gamma subunit | COG1941 | [C] |
| 0539 | 503796 | 504623 | + | 275 | | Coenzyme F420-reducing hydrogenase, beta subunit | COG1035 | [C] |
| 0540 | 504665 | 505129 | + | 154 | | Uncharacterized protein | | |
| 0541 | 505144 | 505872 | + | 242 | | Uncharacterized protein conserved in archaea | COG4047 | [S] |
| 0542 | 506098 | 506835 | + | 245 | | Predicted transcriptional regulator consisting of a V4R domain and a DNA-binding HTH domain | COG0640 & COG1719 | [K][R] |
| 0543 | 506807 | 507148 | - | 113 | | Uncharacterized conserved protein, homolog of gamma-carboxymuconolactone decarboxylase subunit | COG0599 | [S] |
| 0544 | 507396 | 509270 | + | 624 | ThrS | Threonyl-tRNA synthetase | COG0441 | [J] |
| 0545 | 509272 | 509775 | - | 167 | IlvH | Acetolactate synthase, small subunit | COG0440 | [E] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|------------|------------|--------|--------------------|-------|---|----------------|------------------|
| 0546 | 509 917 | 510 690 | + | 257 | TatD | Mg-dependent DNase | COG0084 | [L] |
| 0547 | 510 899 | 511 126 | + | 75 | | Uncharacterized protein | | |
| 0548 | 511 128 | 511 655 | + | 175 | | Predicted Zn-dependent protease | COG1913 | [R] |
| 0549 | 511 613 | 512 170 | + | 185 | | Acetyltransferase | COG0456 | [R] |
| 0550 | 512 386 | 513 675 | + | 429 | GltB1 | Glutamate synthase subunit 2 | COG0069 | [E] |
| 0551 | 513 689 | 514 252 | + | 187 | GuaA2 | Glutamine amidotransferase subunit of GMP synthase | COG0518 | [F] |
| 0552 | 514 237 | 515 541 | + | 434 | NhaP | NhaP-type Na ⁺ /H ⁺ or K ⁺ /H ⁺ antiporter | COG0025 | [P] |
| 0553 | 515 607 | 516 128 | + | 173 | MoaB | Molybdopterin biosynthesis enzyme | COG0521 | [H] |
| 0554 | 516 136 | 516 606 | - | 156 | MoaC | Molybdenum cofactor biosynthesis enzyme | COG0315 | [H] |
| 0555 | 518 513 | 518 920 | + | 135 | | DNA endonuclease related to intein-encoded endonucleases | COG3780 | [L] |
| 0556 | 519 350 | 520 219 | - | 289 | | RecA-superfamily ATPase implicated in signal transduction | COG0467 | [T] |
| 0557 | 520 203 | 520 772 | - | 189 | | Uncharacterized protein conserved in archaea | COG1790 | [S] |
| 0558 | 521 047 | 522 033 | + | 328 | | beta-Ribofuranosylaminobenzene 5'-phosphate synthase (beta-RFAP synthase) | COG1907 | [R] |
| 0559 | 522 045 | 523 307 | + | 420 | SIK1 | Protein implicated in ribosomal biogenesis, Nop56p homolog | COG1498 | [J] |
| 0560 | 523 355 | 524 053 | + | 232 | NOP1 | Fibrillarin-like rRNA methylase | COG1889 | [J] |
| 0561 | 524 303 | 525 274 | + | 323 | PitA | Phosphate/sulphate permeases | COG0306 | [P] |
| 0562 | 525 271 | 525 885 | + | 204 | | Uncharacterized protein | | |
| 0563 | 525 882 | 526 838 | + | 318 | PyrD | Dihydroorotate dehydrogenase | COG0167 | [F] |
| 0564 | 526 826 | 527 614 | + | 262 | PyrK | Dihydroorotate dehydrogenase electron transfer subunit similar to 2-polyprenylphenol hydroxylase and related flavodoxin oxidoreductases | COG0543 | [HC] |
| 0565 | 527 589 | 528 335 | + | 248 | | Glycosyltransferase involved in cell wall biogenesis | COG0463 | [M] |
| 0566 | 528 389 | 529 435 | + | 348 | Exo | 5'-3' exonuclease | COG0258 | [L] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|-------|--|----------------|------------------|
| 0567 | 529503 | 530324 | - | 273 | | Uncharacterized membrane protein, conserved in archaea | COG 3366 | [S] |
| 0568 | 530382 | 531287 | + | 301 | | L-alanine-DL-glutamate epimerase and related enzymes of enolase superfamily | COG 4948 | [MR] |
| 0569 | 531423 | 532460 | + | 345 | | Uncharacterized conserved protein | COG 3367 | [S] |
| 0570 | 532442 | 532792 | - | 116 | | Uncharacterized protein conserved in archaea | COG 4048 | [S] |
| 0571 | 532866 | 533444 | + | 192 | | Uncharacterized metal-binding protein conserved in archaea | COG 4887 | [R] |
| 0572 | 533451 | 534368 | - | 305 | Hdr B | Heterodisulfide reductase, subunit B | COG 2048 | [C] |
| 0573 | 534381 | 534959 | - | 192 | Hdr C | Heterodisulfide reductase, subunit C | COG 1150 | [C] |
| 0574 | 535060 | 535818 | + | 252 | | Transcriptional regulator of the LysR family | COG 0583 | [K] |
| 0575 | 536146 | 536853 | - | 235 | | Uncharacterized protein conserved in archaea | COG 2043 | [S] |
| 0576 | 536956 | 537345 | + | 129 | | Predicted transcriptional regulator | COG 3355 | [K] |
| 0577 | 537359 | 537568 | + | 69 | | Predicted nucleic-acid-binding protein containing an archaeal-type C2H2 Zn-finger | COG 4049 | [R] |
| 0578 | 537647 | 538099 | - | 150 | Tag D | Cytidyltransferase | COG 0615 | [MI] |
| 0579 | 538169 | 538615 | + | 148 | | Uncharacterized protein conserved in archaea | COG 4050 | [S] |
| 0580 | 538628 | 539851 | + | 407 | | Activator of 2-hydroxyglutaryl-CoA dehydratase (HSP70-class ATPase domain) | COG 1924 | [I] |
| 0581 | 539864 | 540490 | + | 208 | | Uncharacterized protein conserved in archaea | COG 4051 | [S] |
| 0582 | 540487 | 541335 | + | 282 | | Predicted Fe-S oxidoreductase | COG 0535 | [R] |
| 0583 | 541340 | 542266 | + | 308 | | Uncharacterized protein conserved in archaea, related to methyl coenzyme M reductase II, operon protein C (mtrC) | COG 4052 | [R] |
| 0584 | 542479 | 543207 | - | 242 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 0585 | 543481 | 544767 | + | 428 | | Uncharacterized protein | | |
| 0586 | 545004 | 545954 | + | 316 | PRI 1 | Eukaryotic-type DNA primase, catalytic (small) subunit | COG 1467 | [L] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|------|--|---------------------|------------------|
| 0587 | 545951 | 546523 | + | 190 | | Uncharacterized conserved protein | COG 1920 | [S] |
| 0588 | 546629 | 547708 | + | 359 | | Predicted ATP-utilizing enzyme of the ATP-grasp superfamily (probably carbolligase) | COG 1759 | [R] |
| 0589 | 547818 | 549116 | + | 432 | ThiD | Hydroxymethylpyrimidine/phosphomethylpyrimidine kinase fused to uncharacterized conserved domain | COG 0351 & COG 1992 | [H][S] |
| 0590 | 549121 | 549732 | + | 203 | | Uncharacterized protein | | |
| 0591 | 549969 | 550763 | + | 264 | | Uncharacterized secreted protein specific for M.kandleri with repeats, MK-6 family | | |
| 0592 | 550754 | 551515 | + | 253 | | Uncharacterized protein specific for M.kandleri with repeats, MK-6 family | | |
| 0593 | 551518 | 551976 | + | 152 | | Uncharacterized protein specific for M.kandleri, MK-6 family | | |
| 0594 | 552664 | 552933 | + | 89 | | Uncharacterized protein | | |
| 0595 | 553054 | 553923 | + | 289 | | Predicted archaea-specific methyltransferase | COG 2521 | [R] |
| 0596 | 553892 | 554356 | - | 154 | | Uncharacterized conserved protein | COG 1833 | [S] |
| 0597 | 554373 | 556742 | + | 789 | | Uncharacterized membrane protein specific for M.kandleri, MK-13 family | | |
| 0598 | 556733 | 557212 | + | 159 | | Uncharacterized protein | | |
| 0599 | 557225 | 558235 | + | 336 | | Predicted methyltransferase | COG 2520 | [R] |
| 0600 | 558229 | 558702 | - | 157 | | RecB-family nuclease | COG 4080 | [L] |
| 0601 | 558753 | 559712 | + | 319 | | ABC-type nitrate/sulfonate/bicarbonate transport systems, periplasmic components | COG 0715 | [P] |
| 0602 | 559712 | 560467 | + | 251 | | ABC-type nitrate/sulfonate/bicarbonate transport system, permease component | COG 0600 | [P] |
| 0603 | 560458 | 561198 | + | 246 | | ABC-type nitrate/sulfonate/bicarbonate transport system, ATPase component | COG 1116 | [P] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|-------------------|------------------|
| 0604 | 561299 | 562033 | + | 244 | | tRNA-dihydrouridine synthase | COG0042 | [J] |
| 0605 | 562156 | 563580 | - | 474 | | Transposase and inactivated derivatives | COG0675 | [L] |
| 0606 | 563941 | 565068 | + | 375 | Kch_1 | Kef-type K ⁺ transport systems, predicted NAD-binding component & Predicted small molecule binding protein (contains 3H domain) | COG1226 & COG1827 | [P][R] |
| 0607 | 566155 | 567084 | - | 309 | ThiL | Thiamine monophosphate kinase | COG0611 | [H] |
| 0608 | 567068 | 567601 | + | 177 | NIP7 | Predicted RNA-binding protein involved in ribosomal biogenesis, contains PUA domain | COG1374 | [J] |
| 0609 | 567603 | 568250 | + | 215 | | Predicted metabolic regulator containing the ACT domain | COG1707 | [R] |
| 0610 | 568264 | 568827 | + | 187 | | Adenine/guanine phosphoribosyltransferases and related PRPP-binding proteins | COG0503 | [F] |
| 0611 | 568818 | 569834 | - | 338 | | Uncharacterized protein conserved in archaea | COG1665 | [S] |
| 0612 | 569848 | 570273 | + | 141 | | Predicted DNA-binding protein with PD1-like DNA-binding motif | COG1661 | [R] |
| 0613 | 570239 | 571111 | - | 290 | Map | Methionine aminopeptidase | COG0024 | [J] |
| 0614 | 571138 | 571800 | + | 220 | | Uncharacterized protein | | |
| 0615 | 572038 | 572349 | - | 103 | | Predicted metal-binding protein conserved in archaea | COG1745 | [R] |
| 0616 | 572365 | 573780 | - | 471 | LonB | Predicted ATP-dependent protease | COG1067 | [O] |
| 0617 | 573932 | 575161 | - | 409 | DnaG | DNA primase (bacterial type) | COG0358 | [L] |
| 0618 | 575280 | 576332 | - | 350 | GapA | Glyceraldehyde-3-phosphate dehydrogenase | COG0057 | [G] |
| 0619 | 576853 | 577878 | - | 341 | SUA7_1 | Transcription initiation factor IIB | COG1405 | [K] |
| 0620 | 578231 | 579271 | - | 346 | SelA | Selenocysteine synthase | COG1921 | [E] |
| 0621 | 579226 | 580800 | - | 524 | | Predicted RNA modification enzyme consisting of a 3-phosphoadenosine 5-phosphosulfate sulfotransferase fused to RNA-binding PUA domain | COG5270 & COG0175 | [J][E][H] |
| 0622 | 580781 | 582307 | - | 508 | ArgH | Argininosuccinate lyase | COG0165 | [E] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|----------------|------------------|
| 0623 | 582471 | 583118 | + | 215 | | Predicted cysteine protease of the transglutaminase-like supefamily | COG1305 | [E] |
| 0624 | 583203 | 583934 | + | 243 | | Uncharacterized protein conserved in archaea | COG1667 | [S] |
| 0625 | 583941 | 584888 | + | 315 | Mch | Methenyltetrahydromethanopterin cyclohydrolase | COG3252 | [H] |
| 0626 | 588697 | 589611 | + | 304 | | Uncharacterized protein specific for M.kandleri, MK-7 family | | |
| 0627 | 589834 | 590232 | - | 132 | FlpD2 | Coenzyme F420-reducing hydrogenase, delta subunit | COG1908 | [C] |
| 0628 | 590310 | 591596 | + | 428 | AroA | 5-enolpyruvylshikimate-3-phosphate synthase | COG0128 | [E] |
| 0629 | 591588 | 592031 | - | 147 | | Predicted hydrocarbon binding protein (contains V4R domain) | COG1719 | [R] |
| 0630 | 592104 | 592511 | - | 135 | | Predicted hydrocarbon binding protein (contains V4R domain) | COG1719 | [R] |
| 0631 | 592609 | 593769 | + | 386 | AroC | Chorismate synthase | COG0082 | [E] |
| 0632 | 593764 | 594639 | - | 291 | | Predicted hydrocarbon binding protein (contains V4R domain) | COG1719 | [R] |
| 0633 | 594757 | 595908 | + | 383 | | Aspartate aminotransferase | COG0075 | [E] |
| 0634 | 595894 | 596667 | - | 257 | | Uncharacterized protein conserved in archaea | COG4053 | [S] |
| 0635 | 596667 | 597305 | + | 212 | SUA5 | Translation factor (SUA5) | COG0009 | [J] |
| 0636 | 597298 | 597756 | + | 152 | | Uncharacterized protein conserved in archaea | COG4090 | [S] |
| 0637 | 597753 | 598430 | + | 225 | | SAM-dependent methyltransferase | COG0500 | [QR] |
| 0638 | 598427 | 598936 | + | 169 | | Uncharacterized conserved protein | COG2042 | [S] |
| 0639 | 598998 | 600539 | - | 513 | | Predicted membrane protein | | |
| 0640 | 600529 | 601014 | - | 161 | | Uncharacterized protein | | |
| 0641 | 601207 | 601356 | + | 49 | RPL40A | Ribosomal protein L40E | COG1552 | [J] |
| 0642 | 601360 | 602079 | + | 239 | | Predicted phosphate-binding enzyme of the TIM-barrel fold | COG1646 | [R] |
| 0643 | 602066 | 602473 | - | 135 | | Uncharacterized protein | | |
| 0644 | 602534 | 603211 | + | 225 | | Predicted ATPase of the PP-loop superfamily | COG2102 | [R] |
| 0645 | 603358 | 604410 | + | 350 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|-------|---|----------------|------------------|
| 0646 | 604733 | 604954 | - | 73 | | Uncharacterized protein | | |
| 0647 | 605491 | 606189 | + | 232 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 0648 | 606223 | 608511 | - | 762 | Hyp F | Hydrogenase maturation factor | COG 0068 | [O] |
| 0649 | 608508 | 609632 | - | 374 | | Uncharacterized protein | | |
| 0650 | 609636 | 610853 | - | 405 | | Fe-S oxidoreductase, related to NifB/MoaA family | COG 1625 | [C] |
| 0651 | 611026 | 612360 | + | 444 | Mcr B | Methyl coenzyme M reductase, beta subunit | COG 4054 | [H] |
| 0652 | 612470 | 612991 | + | 173 | Mcr D | Methyl coenzyme M reductase, subunit D | COG 4055 | [H] |
| 0653 | 613000 | 613608 | + | 202 | Mcr C | Methyl coenzyme M reductase, subunit C | COG 4056 | [H] |
| 0654 | 613750 | 614523 | + | 257 | Mcr G | Methyl coenzyme M reductase, gamma subunit | COG 4057 | [H] |
| 0655 | 614620 | 616281 | + | 553 | Mcr A | Methyl coenzyme M reductase, alpha subunit | COG 4058 | [H] |
| 0656 | 616411 | 617307 | + | 298 | MtrE | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit E | COG 4059 | [H] |
| 0657 | 617423 | 618100 | + | 225 | MtrD | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit D | COG 4060 | [H] |
| 0658 | 618120 | 618932 | + | 270 | MtrC | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit C | COG 4061 | [H] |
| 0659 | 618946 | 619284 | + | 112 | MtrB | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit B | COG 4062 | [H] |
| 0660 | 619299 | 620057 | + | 252 | MtrA | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit A | COG 4063 | [H] |
| 0661 | 620071 | 620295 | + | 74 | Mtr G | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit G | COG 4064 | [H] |
| 0662 | 620318 | 621286 | + | 322 | MtrH | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit H | COG 1962 | [H] |
| 0663 | 621086 | 622561 | - | 491 | | Predicted protein of the CobN/Mg-chelatase family, a fragment | COG 1429 | [H] |
| 0664 | 622607 | 624328 | + | 573 | | Predicted protein of the CobN/Mg-chelatase family, a fragment | COG 1429 | [H] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|---|-------------------|------------------|
| 0665 | 624364 | 625800 | + | 478 | | Uncharacterized protein conserved in archaea | COG4065 | [S] |
| 0666 | 625919 | 626347 | + | 142 | | Uncharacterized protein conserved in archaea | COG4066 | [S] |
| 0667 | 626344 | 627258 | + | 304 | Met E | Methionine synthase II (cobalamin-independent) | COG0620 | [E] |
| 0668 | 627325 | 627636 | + | 103 | | Uncharacterized protein conserved in archaea | | |
| 0669 | 627780 | 628319 | - | 179 | | Membrane-associated phospholipid phosphatase | COG0671 | [I] |
| 0670 | 628363 | 628776 | - | 137 | | Predicted NADH-flavin reductase | COG2510 | [S] |
| 0671 | 628773 | 629018 | - | 81 | | Uncharacterized protein | | |
| 0672 | 629019 | 630314 | - | 431 | | Pyridoxal-phosphate-dependent enzyme related to glutamate decarboxylase | COG0076 | [E] |
| 0673 | 630694 | 631617 | + | 307 | | tRNA/rRNA cytosine-C5-methylase | COG0144 | [J] |
| 0674 | 631691 | 632797 | + | 368 | | RIO1-like serine/threonine protein kinase fused to an N-terminal DNA-binding HTH domain | COG0478 | [T] |
| 0675 | 632724 | 633431 | + | 235 | | NCAIR mutase | COG1691 | [R] |
| 0676 | 633524 | 634726 | + | 400 | | Uncharacterized conserved protein | COG0585 | [S] |
| 0677 | 634723 | 634887 | - | 54 | | Zn-ribbon-containing protein | | |
| 0678 | 634980 | 635999 | + | 339 | Trp D | Anthranilate phosphoribosyltransferase | COG0547 | [E] |
| 0679 | 636060 | 639833 | - | 1257 | Fus A | Translation elongation and release factor (GTPase), contains an intein | COG0480 & COG1372 | [J][L] |
| 0680 | 639848 | 640441 | - | 197 | Rps G | Ribosomal protein S7 | COG0049 | [J] |
| 0681 | 640545 | 640988 | - | 147 | Rps L | Ribosomal protein S12 | COG0048 | [J] |
| 0682 | 641007 | 641435 | - | 142 | Nus A_1 | Transcription elongation factor NusA | COG0195 | [K] |
| 0683 | 641451 | 641780 | - | 109 | RPL 30 | Ribosomal protein L30E | COG1911 | [J] |
| 0684 | 642269 | 643558 | - | 429 | Rpo C_1 | DNA-directed RNA polymerase largest subunit, the N-terminal part | COG0086 | [K] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|--|----------------|------------------|
| 0685 | 643555 | 646416 | - | 953 | Rpo C_2 | DNA-directed RNA polymerase largest subunit, the C-terminal part | COG 0086 | [K] |
| 0686 | 646413 | 648335 | - | 640 | Rpo B_1 | DNA-directed RNA polymerase second-largest subunit, the N-terminal part | COG 0085 | [K] |
| 0687 | 648385 | 649962 | - | 525 | Rpo B_2 | DNA-directed RNA polymerase second-largest subunit, the N-terminal part | COG 0085 | [K] |
| 0688 | 649995 | 650273 | - | 92 | RPB 5 | DNA-directed RNA polymerase subunit H | COG 2012 | [K] |
| 0689 | 650240 | 650781 | - | 180 | | Ferredoxin | COG 1145 | [C] |
| 0690 | 650789 | 653419 | - | 876 | Sbc C | SMC1-family ATPase involved in DNA repair | COG 0419 | [L] |
| 0691 | 653427 | 654782 | - | 451 | Sbc D | DNA repair exonuclease of the SbcD/Mre11-family | COG 0420 | [L] |
| 0692 | 654785 | 656368 | - | 527 | | Predicted P-loop ATPase | COG 0433 | [R] |
| 0693 | 656349 | 657518 | - | 389 | | Uncharacterized protein conserved in archaea | | |
| 0694 | 657749 | 658219 | - | 156 | | Uncharacterized protein | | |
| 0695 | 658227 | 658802 | - | 191 | | Uncharacterized protein | | |
| 0696 | 658768 | 659217 | - | 149 | | Uncharacterized conserved protein | COG 1991 | [S] |
| 0697 | 659236 | 661821 | + | 861 | | Uncharacterized protein | | |
| 0698 | 661961 | 663658 | - | 565 | | Uncharacterized secreted protein | | |
| 0699 | 663655 | 664569 | - | 304 | | Uncharacterized secreted protein | | |
| 0700 | 664566 | 664736 | - | 56 | | Uncharacterized secreted protein | | |
| 0701 | 664747 | 664935 | - | 62 | | Predicted secreted protein specific for M.kandleri, MK-18 family | | |
| 0702 | 664932 | 665126 | - | 64 | | Predicted secreted protein specific for M.kandleri, MK-19 family | | |
| 0703 | 665111 | 666085 | - | 324 | Ppp A | Type II secretory pathway, prepilin signal peptidase PulO and related peptidases | COG 1989 | [NO U] |
| 0704 | 666091 | 667089 | - | 332 | | Uncharacterized protein | | |
| 0705 | 668048 | 669025 | - | 325 | | Fli pilus assembly protein TadC | COG 2064 | [NU] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|-----------|---|----------------|------------------|
| 0706 | 669056 | 670144 | - | 362 | | Flp pilus assembly protein TadC | COG 2064 | [NU] |
| 0707 | 670334 | 672142 | - | 602 | | Flp pilus assembly protein, ATPase CpaF | COG 4962 | [U] |
| 0708 | 672151 | 673908 | - | 585 | | Predicted AAA+ class ATPase with chaperone activity | COG 0606 | [O] |
| 0709 | 673914 | 674513 | - | 199 | RsmC | 16S RNA G1207 methylase RsmC | COG 2813 | [J] |
| 0710 | 675105 | 676400 | - | 431 | AsnS | Aspartyl/asparaginyl-tRNA synthetases | COG 0017 | [J] |
| 0711 | 676444 | 677739 | - | 431 | HisD | Histidinol dehydrogenase | COG 0141 | [E] |
| 0712 | 677717 | 678481 | - | 254 | | Uncharacterized protein conserved in archaea | COG 1701 | [S] |
| 0713 | 678478 | 679608 | - | 376 | Dfp | Phosphopantothenoylcysteine synthetase/decarboxylase | COG 0452 | [H] |
| 0714 | 679601 | 680143 | - | 180 | NusA 2 | Transcription elongation factor NusA | COG 0195 | [K] |
| 0715 | 680294 | 680575 | + | 93 | Ssh 10b 1 | Archaea-specific DNA-binding protein | COG 1581 | [K] |
| 0716 | 680541 | 682988 | - | 815 | | Uncharacterized protein specific for M.kandleri, MK-40 family | | |
| 0717 | 682947 | 685229 | + | 760 | Cdh A 1 | CO dehydrogenase/acetyl-CoA synthase alpha subunit | COG 1152 | [C] |
| 0718 | 685235 | 685714 | + | 159 | Cdh B | CO dehydrogenase/acetyl-CoA synthase epsilon subunit | COG 1880 | [C] |
| 0719 | 685725 | 687623 | + | 632 | Cdh A 1 | CO dehydrogenase/acetyl-CoA synthase alpha subunit | COG 1152 | [C] |
| 0720 | 687632 | 689035 | + | 467 | Cdh C | CO dehydrogenase/acetyl-CoA synthase beta subunit | COG 1614 | [C] |
| 0721 | 689032 | 689805 | + | 257 | Coo C 1 | CO dehydrogenase maturation factor | COG 3640 | [D] |
| 0722 | 689798 | 691000 | + | 400 | Cdh D | CO dehydrogenase/acetyl-CoA synthase delta subunit (corrinoid Fe-S protein) | COG 2069 | [C] |
| 0723 | 691014 | 692402 | + | 462 | Cdh E | CO dehydrogenase/acetyl-CoA synthase gamma subunit (corrinoid Fe-S protein) | COG 1456 | [C] |
| 0724 | 692457 | 693386 | + | 309 | | Nucleoside-diphosphate-sugar epimerase | COG 0451 | [MG] |
| 0725 | 693426 | 693929 | + | 167 | Hyc B | Fe-S-cluster-containing hydrogenase component | COG 1142 | [C] |
| 0726 | 693907 | 694650 | + | 247 | Coo C 2 | CO dehydrogenase maturation factor | COG 3640 | [D] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|-------------------|------------------|
| 0727 | 694590 | 694850 | + | 86 | | Ferredoxin | COG1146 | [C] |
| 0728 | 694843 | 695961 | + | 372 | PorA_2 | Pyruvate:ferredoxin oxidoreductase, alpha subunit | COG0674 | [C] |
| 0729 | 695958 | 696773 | + | 271 | PorB_2 | Pyruvate:ferredoxin oxidoreductase, beta subunit | COG1013 | [C] |
| 0730 | 696757 | 697287 | + | 176 | PorG_2 | Pyruvate:ferredoxin oxidoreductase, gamma subunit | COG1014 | [C] |
| 0731 | 697284 | 698363 | + | 359 | SucC | Succinyl-CoA synthetase beta subunit | COG0045 | [C] |
| 0732 | 698367 | 699230 | + | 287 | SucD | Succinyl-CoA synthetase alpha subunit | COG0074 | [C] |
| 0733 | 699231 | 700091 | + | 286 | | Predicted archaea-specific kinase of the sugar kinase superfamily | COG1829 | [R] |
| 0734 | 700084 | 700260 | + | 58 | | Predicted RNA-binding protein | COG1532 | [R] |
| 0735 | 700349 | 701005 | - | 218 | PyrF | Orotidine-5'-phosphate decarboxylase | COG0284 | [F] |
| 0736 | 700981 | 701478 | - | 165 | | Uncharacterized protein | | |
| 0737 | 701479 | 702372 | - | 297 | DYS1 | Deoxyhypusine synthase | COG1899 | [O] |
| 0738 | 702369 | 703142 | - | 257 | SpeB | Agmatinase | COG0010 | [E] |
| 0739 | 703117 | 703527 | - | 136 | Efp | Translation initiation factor eIF-5A | COG0231 | [J] |
| 0740 | 703599 | 704051 | + | 150 | SpeA | Pyruvoyl-dependent arginine decarboxylase (PviArgDC) [Contains: Pyruvoyl-dependent arginine decarboxylase beta subunit; Pyruvoyl-dependent arginine decarboxylase alpha subunit] | COG1945 | [S] |
| 0741 | 704058 | 705071 | + | 337 | SuhB | Archaea-specific fructose-1,6-bisphosphatase fused to predicted pyrophosphatase of the PRA-PH family | COG0483 & COG1694 | [G][R] |
| 0742 | 705044 | 705874 | + | 276 | | Predicted sugar kinase | COG0061 | [G] |
| 0743 | 705968 | 706243 | - | 91 | HHT1_2 | Histones H3/H4 | COG2036 | [L] |
| 0744 | 706262 | 706693 | + | 143 | | Predicted nuclei-acid-binding protein, consists of a PIN domain and a Zn-ribbon | COG1439 | [R] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|---------------------|------------------|
| 0745 | 706675 | 707529 | + | 284 | | Predicted metalloprotease fused to aspartyl protease | COG 4067 & COG 4740 | [O][R] |
| 0746 | 707526 | 708443 | + | 305 | HemC | Porphobilinogen deaminase | COG 0181 | [H] |
| 0747 | 708436 | 709227 | + | 263 | DPH5 | Methyltransferase involved in diphthamide biosynthesis | COG 1798 | [J] |
| 0748 | 709231 | 709587 | + | 118 | | Uncharacterized protein conserved in archaea | COG 1885 | [S] |
| 0749 | 709592 | 710701 | - | 369 | | Uncharacterized protein conserved in archaea, possible membrane metallohydrolase | | |
| 0750 | 710703 | 711950 | - | 415 | | Uncharacterized protein conserved in archaea, Zn-ribbon domain containing | | |
| 0751 | 711973 | 712422 | - | 149 | | Uncharacterized protein conserved in archaea | | |
| 0752 | 712425 | 713867 | - | 480 | MurE_1 | UDP-N-acetylmuramyl tripeptide synthase | COG 0769 | [M] |
| 0753 | 713877 | 714947 | - | 356 | MraY | UDP-N-acetylmuramyl pentapeptide phosphotransferase | COG 0472 | [M] |
| 0754 | 714964 | 716103 | - | 379 | CarB_1 | Carbamoylphosphate synthase large subunit | COG 0458 | [EF] |
| 0755 | 716100 | 717638 | - | 512 | MurC | UDP-N-acetylmuramate-alanine ligase | COG 0773 | [M] |
| 0756 | 717691 | 718695 | - | 334 | | Predicted ATPase of the PP-loop superfamily implicated in cell cycle control | COG 0037 | [D] |
| 0757 | 718688 | 720403 | - | 571 | GlnS | Glutamyl-tRNA synthetase | COG 0008 | [J] |
| 0758 | 720849 | 722627 | - | 592 | ArgS | Arginyl-tRNA synthetase | COG 0018 | [J] |
| 0759 | 722643 | 723872 | - | 409 | eRF1 | Peptide chain release factor eRF1 | COG 1503 | [J] |
| 0760 | 723901 | 724572 | + | 223 | PyrH | Uridylate kinase | COG 0528 | [F] |
| 0761 | 724579 | 724770 | + | 63 | | Zn-ribbon containing protein | COG 4068 | [S] |
| 0762 | 724738 | 725484 | - | 248 | | Predicted RNA methylase | COG 4076 | [R] |
| 0763 | 725481 | 726020 | - | 179 | | Uncharacterized conserved protein | COG 1432 | [S] |
| 0764 | 726042 | 726800 | - | 252 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|----------------|------------------|
| 0765 | 726742 | 727086 | - | 114 | | Uncharacterized protein | | |
| 0766 | 727083 | 728198 | - | 371 | PhoH | Phosphate starvation-inducible protein PhoH, predicted ATPase | COG1702 | [T] |
| 0767 | 728211 | 729026 | - | 271 | UppS | Undecaprenyl pyrophosphate synthase | COG0020 | [I] |
| 0768 | 729066 | 729563 | + | 165 | | Predicted phosphoesterase | COG0622 | [R] |
| 0769 | 729717 | 730787 | + | 356 | | tRNA/rRNA cytosine-C5-methylase | COG0144 | [J] |
| 0770 | 730816 | 731811 | + | 331 | | Predicted integral membrane protein | COG0392 | [S] |
| 0771 | 732207 | 734036 | + | 609 | | Predicted acyltransferase | COG4801 | [R] |
| 0772 | 734033 | 734974 | - | 313 | | Carbonic anhydrases/acetyltransferase homolog, isoleucine patch superfamily | COG0663 | [R] |
| 0773 | 735042 | 735533 | - | 163 | | Uncharacterized protein conserved in archaea | COG4072 | [S] |
| 0774 | 735536 | 736510 | - | 324 | IspA | Geranylgeranyl pyrophosphate synthase | COG0142 | [H] |
| 0775 | 736523 | 737884 | - | 453 | | Predicted hydrolase of the metallo-beta-lactamase superfamily | COG0595 | [R] |
| 0776 | 737872 | 738996 | - | 374 | LldD | L-lactate dehydrogenase (FMN-dependent) | COG1304 | [C] |
| 0777 | 738974 | 739693 | - | 239 | | Predicted archaeal kinase | COG1608 | [R] |
| 0778 | 739816 | 740862 | + | 348 | Thil1 | Thiamine biosynthesis ATP pyrophosphatase | COG0301 | [H] |
| 0779 | 740929 | 741837 | + | 302 | | FOG: CBS domain | COG0517 | [R] |
| 0780 | 741887 | 743083 | + | 398 | | Uncharacterized conserved protein | COG3287 | [S] |
| 0781 | 743138 | 743650 | + | 170 | LeuD_1 | 3-isopropylmalate dehydratase small subunit | COG0066 | [E] |
| 0782 | 743656 | 744663 | + | 335 | LeuB_1 | Isocitrate/isopropylmalate dehydrogenase | COG0473 | [E] |
| 0783 | 744973 | 745683 | + | 236 | | Uncharacterized protein | | |
| 0784 | 745708 | 746904 | + | 398 | TrpB | Tryptophan synthase beta chain | COG0133 | [E] |
| 0785 | 746905 | 747300 | - | 131 | | Predicted hydrocarbon binding protein (contains V4R domain) | COG1719 | [R] |
| 0786 | 747316 | 747681 | + | 121 | | Uncharacterized protein conserved in archaea | COG2098 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------------------|--|---------------------|------------------|
| 0787 | 747678 | 748961 | + | 427 | | Protein containing cytidyltransferase domain and predicted nucleotidyltransferase (HIG superfamily) domain | COG 0615 & COG 1323 | [M][R] |
| 0788 | 748958 | 750166 | + | 402 | | Fe-S oxidoreductase family protein | COG 1032 | [C] |
| 0789 | 750112 | 750972 | + | 286 | | Possible metal-dependent hydrolase | | |
| 0790 | 750903 | 751583 | - | 226 | PurL ₋₁ | Phosphoribosylformylglycinamide (FGAM) synthase, glutamine amidotransferase subunit | COG 0047 | [F] |
| 0791 | 751653 | 751907 | - | 84 | PurS | Phosphoribosylformylglycinamide (FGAM) synthase, PurS subunit | COG 1828 | [F] |
| 0792 | 751904 | 752647 | - | 247 | PurC | Phosphoribosylaminoimidazolesuccinocarboxamide (SAICAR) synthase | COG 0152 | [F] |
| 0793 | 752727 | 753977 | + | 416 | | Uncharacterized conserved protein | COG 3287 | [S] |
| 0794 | 753993 | 755180 | + | 395 | | Uncharacterized protein conserved in archaea | COG 4069 | [S] |
| 0795 | 755237 | 756220 | + | 327 | | Selenophosphate synthetase | COG 2144 | [R] |
| 0796 | 756217 | 757752 | + | 511 | | Predicted peptidyl-prolyl cis-trans isomerase (rotamase), cyclophilin family | COG 4070 | [O] |
| 0797 | 757749 | 759056 | + | 435 | | Fe-S oxidoreductase | COG 1032 | [C] |
| 0798 | 759053 | 760315 | + | 420 | TyrA ₂ | Prephenate dehydrogenase | COG 0287 | [E] |
| 0799 | 760363 | 762369 | - | 668 | | Coenzyme F420-reducing hydrogenase, beta subunit fused to oxidoreductase related to Nitrite reductase and Dissimilatory sulfite reductase (desulfovibrin), alpha and beta subunits | COG 1035 & COG 2221 | [C][C] |
| 0800 | 762431 | 762814 | + | 127 | | Predicted transcriptional regulator containing a wHTH DNA-binding domain | COG 3355 | [K] |
| 0801 | 762811 | 763422 | + | 203 | | Oxidoreductase related to Nitrite reductase and Dissimilatory sulfite reductase (desulfovibrin), alpha and beta subunits | COG 2221 | [C] |
| 0802 | 763376 | 764641 | - | 421 | | Uncharacterized protein | | |
| 0803 | 764701 | 765237 | + | 178 | | SpoU-like RNA methylase | COG 1303 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|-------------------|------------------|
| 0804 | 765234 | 765932 | + | 232 | ApaH | Diadenosine tetraphosphatase | COG0639 | [T] |
| 0805 | 765929 | 766717 | - | 262 | | Uncharacterized protein | | |
| 0806 | 766921 | 768012 | - | 363 | | Possible Zn-dependent metallohydrolase | | |
| 0807 | 768031 | 768816 | + | 261 | | Uncharacterized conserved protein | COG1912 | [S] |
| 0808 | 768856 | 770355 | - | 499 | | Short chain dehydrogenase fused to sugar kinase | COG0062 & COG0063 | [S][G] |
| 0809 | 770475 | 771254 | + | 259 | | ABC-type antimicrobial peptide transport system, ATPase component | COG1136 | [V] |
| 0810 | 771251 | 771961 | + | 236 | HypB_1 | Ni ²⁺ -binding GTPase involved in regulation of expression and maturation of urease and hydrogenase | COG0378 | [OK] |
| 0811 | 771930 | 772610 | + | 226 | | Predicted Fe-S protein | COG2000 | [R] |
| 0812 | 772762 | 773676 | - | 304 | | Uncharacterized conserved protein | COG1578 | [S] |
| 0813 | 773691 | 774935 | - | 414 | | Predicted membrane-associated Zn-dependent protease | COG0750 | [M] |
| 0814 | 774937 | 775368 | - | 143 | | Uncharacterized conserved protein | COG0432 | [S] |
| 0815 | 775372 | 776106 | + | 244 | MscS | Small-conductance mechanosensitive channel | COG0668 | [M] |
| 0816 | 776227 | 777129 | + | 300 | Ftr_2 | Formylmethanofuran:tetrahydromethanopterin formyltransferase | COG2037 | [C] |
| 0817 | 777133 | 778026 | + | 297 | | Sugar kinase of the ribokinase family | COG0524 | [G] |
| 0818 | 778042 | 778800 | - | 252 | | Organic-radical-activating enzyme | COG0602 | [O] |
| 0819 | 778761 | 779243 | - | 160 | | 6-pyruvoyl-tetrahydropterin synthase | COG0720 | [H] |
| 0820 | 779435 | 781207 | + | 590 | PheT | Phenylalanyl-tRNA synthetase beta subunit | COG0072 | [J] |
| 0821 | 781211 | 782434 | + | 407 | FtsZ_1 | FtsZ GTPase involved in cell division | COG0206 | [D] |
| 0822 | 782450 | 782635 | + | 61 | Sss1 | Protein translocase subunit Sss1 | COG2443 | [U] |
| 0823 | 782651 | 783142 | + | 163 | NusG | Transcription antiterminator NusG | COG0250 | [K] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0824 | 783170 | 783670 | + | 166 | RplK | Ribosomal protein L11 | COG0080 | [J] |
| 0825 | 783684 | 784328 | + | 214 | RplA | Ribosomal protein L1 | COG0081 | [J] |
| 0826 | 784328 | 785416 | + | 362 | RplJ | Ribosomal protein L10 | COG0244 | [J] |
| 0827 | 785439 | 785981 | + | 180 | | Predicted nucleotide kinase | COG1618 | [F] |
| 0828 | 785987 | 787657 | + | 556 | SdhA | Succinate dehydrogenase/fumarate reductase, flavoprotein subunit | COG1053 | [C] |
| 0829 | 787632 | 789431 | - | 599 | AdeC | Adenine deaminase | COG1001 | [F] |
| 0830 | 789454 | 790515 | - | 353 | | Uncharacterized protein specific for M.kandleri, MK-25 family | | |
| 0831 | 790663 | 791670 | - | 335 | | Uncharacterized membrane protein specific for M.kandleri, MK-24 family | | |
| 0832 | 791741 | 792721 | - | 326 | IlvC | Ketol-acid reductoisomerase | COG0059 | [EH] |
| 0833 | 792735 | 793019 | - | 94 | RPL14A | Ribosomal protein L14E | COG2163 | [J] |
| 0834 | 793046 | 794548 | + | 500 | | Uncharacterized membrane protein | | |
| 0835 | 794560 | 797016 | + | 818 | | Archaea-specific Superfamily II helicase | COG1202 | [R] |
| 0836 | 797005 | 798327 | - | 440 | | Uncharacterized protein | | |
| 0837 | 798324 | 798665 | - | 113 | | Uncharacterized protein | | |
| 0838 | 798710 | 799576 | + | 288 | | Uncharacterized protein conserved in archaea | COG4071 | [S] |
| 0839 | 799566 | 800123 | - | 185 | SPT15 | Transcription initiation factor TFIID (TATA-binding protein) | COG2101 | [K] |
| 0840 | 800146 | 801222 | - | 358 | | Predicted molecular chaperone distantly related to HSP70-fold metalloproteases | COG2377 | [O] |
| 0841 | 801199 | 801678 | + | 159 | RpIV | Ribosomal protein L22 | COG0091 | [J] |
| 0842 | 801692 | 802375 | + | 227 | RpsC | Ribosomal protein S3 | COG0092 | [J] |
| 0843 | 802379 | 802612 | + | 77 | RpmC | Ribosomal protein L29 | COG0255 | [J] |
| 0844 | 802632 | 802952 | + | 106 | SUI1 | Translation initiation factor (SUI1) | COG0023 | [J] |
| 0845 | 802945 | 803634 | - | 229 | | SAM-dependent methyltransferase | COG0500 | [QR] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|-------------------|------------------|
| 0846 | 803550 | 803876 | + | 108 | POP4_1 | RNAse P subunit P29 | COG1588 | [J] |
| 0847 | 803850 | 804587 | - | 245 | | Membrane protease subunit, stomatin/prohibitin homolog | COG0330 | [O] |
| 0848 | 804584 | 805012 | - | 142 | | Membrane protein implicated in regulation of membrane protease activity | COG1585 | [OU] |
| 0849 | 805062 | 806366 | + | 434 | Lpd | Dihydrolipoamide dehydrogenase | COG1249 | [C] |
| 0850 | 806368 | 808374 | - | 668 | MetG | Methionyl-tRNA synthetase | COG0143 & COG0073 | [J][R] |
| 0851 | 808381 | 809715 | - | 444 | | Uncharacterized membrane protein specific for M.kandleri, MK-15 family | | |
| 0852 | 809802 | 810416 | - | 204 | | Uncharacterized protein | | |
| 0853 | 810419 | 811066 | - | 215 | | Uncharacterized membrane protein specific for M.kandleri, MK-15 family | | |
| 0854 | 811293 | 812264 | - | 323 | | Predicted UDP-N-acetylglucosamine 2-epimerase of the MurG family | | |
| 0855 | 812269 | 812874 | - | 201 | HisB | Imidazoleglycerol-phosphate dehydratase | COG0131 | [E] |
| 0856 | 812939 | 813283 | + | 114 | | Predicted RNA-binding protein containing a TRAM domain | COG4085 | [R] |
| 0857 | 813255 | 814070 | + | 271 | | Uncharacterized protein | | |
| 0858 | 814061 | 814984 | - | 307 | SUA7_2 | Transcription initiation factor IIB | COG1405 | [K] |
| 0859 | 815000 | 815284 | - | 94 | GAR1 | RNA-binding protein involved in rRNA processing | COG3277 | [J] |
| 0860 | 815362 | 815964 | - | 200 | | Ferredoxin | COG1146 | [C] |
| 0861 | 815970 | 816254 | + | 94 | | Uncharacterized protein | | |
| 0862 | 816285 | 817220 | + | 311 | PhoU | Phosphate uptake regulator | COG0704 | [P] |
| 0863 | 817232 | 817948 | + | 238 | FtsZ_2 | FtsZ GTPase involved in cell division | COG0206 | [D] |
| 0864 | 817961 | 818197 | + | 78 | | Predicted DNA-binding protein | | |
| 0865 | 818237 | 819400 | + | 387 | | Predicted kinase related to thiamine pyrophosphokinase | COG1364 | [E] |
| 0866 | 819624 | 820862 | + | 412 | | Uncharacterized conserved protein | COG1915 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0867 | 820834 | 821088 | - | 84 | | Uncharacterized protein conserved in archaea | COG4082 | |
| 0868 | 821117 | 822100 | + | 327 | | 2-Phosphoglycerate kinase | COG2074 | [G] |
| 0869 | 822107 | 822523 | + | 138 | | CBS-domain-containing protein | COG0517 | [R] |
| 0870 | 822747 | 823631 | - | 294 | | Uncharacterized protein | | |
| 0871 | 823635 | 824180 | - | 181 | CyaB | Adenylate cyclase, class 2 (thermophilic) | COG1437 | [F] |
| 0872 | 824222 | 825364 | - | 380 | EriC | Chloride channel protein EriC | COG0038 | [P] |
| 0873 | 825400 | 825711 | + | 103 | CpsB_1 | Mannose-6-phosphate isomerase | COG0662 | [G] |
| 0874 | 825979 | 826695 | + | 238 | | Acetyltransferase (the isoleucine patch superfamily) | COG0110 | [R] |
| 0875 | 826703 | 827305 | + | 200 | | Uncharacterized protein | | |
| 0876 | 827312 | 828238 | + | 308 | CitG2 | Triphosphoribosyl-dephospho-CoA synthetase | COG1767 | [H] |
| 0877 | 828174 | 828677 | + | 167 | | Uncharacterized protein | | |
| 0878 | 828838 | 830148 | + | 436 | RPT1 | ATP-dependent 26S proteasome regulatory subunit | COG1222 | [O] |
| 0879 | 830233 | 831030 | + | 265 | | Uncharacterized protein | | |
| 0880 | 830924 | 831646 | + | 240 | | Glycosyltransferase involved in cell wall biogenesis | COG0463 | [M] |
| 0881 | 831689 | 833029 | + | 446 | | NAD(FAD)-dependent dehydrogenase | COG0446 | [R] |
| 0882 | 833026 | 833541 | + | 171 | | Permease related to cation transporters | COG1824 | [P] |
| 0883 | 833538 | 834059 | + | 173 | | Permease related to cation transporters | COG1824 | [P] |
| 0884 | 834071 | 834661 | + | 196 | | Uncharacterized conserved protein | COG3273 | [S] |
| 0885 | 834663 | 834959 | + | 98 | | Predicted transcriptional regulator consisting of an HTH domain fused to a Zn-ribbon | COG3357 | [K] |
| 0886 | 834949 | 835605 | - | 218 | | Uncharacterized protein | | |
| 0887 | 835602 | 836366 | - | 254 | | Uncharacterized protein | | |
| 0888 | 836360 | 837130 | - | 256 | TruA | Pseudouridylate synthase (tRNA psi55) | COG0101 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|---------------------|------------------|
| 0889 | 837127 | 838032 | - | 301 | | Predicted enzyme related to selenophosphate synthetase | COG 2144 | [R] |
| 0890 | 838029 | 839210 | - | 393 | | Predicted membrane protein | COG 1784 | [S] |
| 0891 | 839229 | 839777 | + | 182 | | Predicted membrane protein | | |
| 0892 | 839829 | 841106 | - | 425 | | Nucleoside-diphosphate-sugar pyrophosphorylase involved in lipopolysaccharide biosynthesis/translation initiation factor eIF2B subunit | COG 1208 | [MJ] |
| 0893 | 841103 | 842461 | - | 452 | CpsG_1 | Phosphomannomutase | COG 1109 | [G] |
| 0894 | 842475 | 843281 | + | 268 | | Predicted DNA-modification methylase | COG 1041 | [L] |
| 0895 | 843334 | 844707 | - | 457 | | Fe-S oxidoreductase similar to Mg-protoporphyrin IX monomethyl ester oxidative cyclase-related protein and subunits of a Ni-chelatase for the biosynthesis of the Ni-containing coenzyme F430, which is essential for the production of methane in methanogens | COG 1032 | [C] |
| 0896 | 844704 | 846110 | - | 468 | | Fe-S oxidoreductase fused to a metal-binding domain | COG 4001 & COG 0535 | [R][R] |
| 0897 | 846128 | 847237 | - | 369 | ThiH_1 | Predicted enzyme related to thiamine biosynthesis enzyme ThiH | COG 1060 | [HR] |
| 0898 | 847218 | 848360 | - | 380 | ThiH_2 | Predicted enzyme related to thiamine biosynthesis enzyme ThiH | COG 1060 | [HR] |
| 0899 | 848389 | 851631 | + | 1080 | IleS | Isoleucyl-tRNA synthetase | COG 0060 | [J] |
| 0900 | 851628 | 854384 | + | 918 | AlaS | Alanyl-tRNA synthetase | COG 0013 | [J] |
| 0901 | 854758 | 856533 | - | 591 | NrdD | Oxygen-sensitive ribonucleoside-triphosphate reductase | COG 1328 | [F] |
| 0902 | 856681 | 858303 | - | 540 | | Uncharacterized protein | | |
| 0903 | 858399 | 858818 | + | 139 | | Ferredoxin | COG 1145 | [C] |
| 0904 | 858815 | 859825 | + | 336 | | Predicted protease of the collagenase family | COG 0826 | [O] |
| 0905 | 859827 | 860189 | + | 120 | | Predicted metal-binding protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|--|---------------------|------------------|
| 0906 | 860186 | 860890 | + | 234 | | Predicted protease of the collagenase family | COG 0826 | [O] |
| 0907 | 860862 | 862367 | - | 501 | | predicted regulatory protein consisting of an uncharacterized conserved domain fused to a CBS domain | COG 1900 & COG 0517 | [S][R] |
| 0908 | 862342 | 863466 | - | 374 | Thil 2 | ATP pyrophosphatase involved in thiamine biosynthesis | COG 0301 | [H] |
| 0909 | 863512 | 864411 | + | 299 | | Uncharacterized conserved protein | COG 2013 | [S] |
| 0910 | 864567 | 866477 | - | 636 | | Predicted membrane protein, MK-44 family | | |
| 0911 | 866594 | 868288 | - | 564 | Car B 2 | Carbamoylphosphate synthase large subunit | COG 0458 | [EF] |
| 0912 | 868674 | 869447 | + | 257 | | Uncharacterized protein | | |
| 0913 | 869366 | 870883 | + | 505 | | Predicted membrane protein | | |
| 0914 | 870784 | 873003 | - | 739 | | Predicted membrane protein, MK-44 family | | |
| 0915 | 872967 | 873524 | - | 185 | | Uncharacterized protein | | |
| 0916 | 873521 | 874090 | - | 189 | | Predicted membrane protein | | |
| 0917 | 874490 | 875560 | - | 356 | | Nucleoside-diphosphate-sugar pyrophosphorylase involved in lipopolysaccharide biosynthesis/translation initiation factor eIF2B subunit | COG 1208 | [MJ] |
| 0918 | 875582 | 876487 | - | 301 | Aga S | Predicted phosphosugar isomerase | COG 2222 | [M] |
| 0919 | 876477 | 876932 | - | 151 | | Uncharacterized membrane protein | COG 2246 | [S] |
| 0920 | 876957 | 878327 | + | 456 | Cps G 2 | Phosphomannomutase | COG 1109 | [G] |
| 0921 | 878332 | 879759 | + | 475 | Top 6B | DNA topoisomerase VI, subunit B | COG 1389 | [L] |
| 0922 | 880054 | 881355 | + | 433 | | Uncharacterized protein specific for M.kandleri, MK-19 family | | |
| 0923 | 881345 | 881530 | - | 61 | | Uncharacterized protein | | |
| 0924 | 882370 | 883326 | + | 318 | | Uncharacterized protein conserved in archaea | COG 3366 | [S] |
| 0925 | 883220 | 884197 | - | 325 | | Uncharacterized protein specific for M.kandleri, MK-36 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|---------------------|------------------|
| 0926 | 884275 | 885705 | + | 476 | MurE_1 | UDP-N-acetylmuramyl tripeptide synthase | COG 0769 | [M] |
| 0927 | 885706 | 886470 | + | 254 | | Uncharacterized protein conserved in archaea | | |
| 0928 | 886477 | 887508 | + | 343 | PflX | Uncharacterized Fe-S protein PflX, homolog of pyruvate formate lyase activating protein | COG 1313 | [R] |
| 0929 | 887505 | 888422 | - | 305 | | Coenzyme F420-reducing hydrogenase, beta subunit | COG 1035 | [C] |
| 0930 | 888425 | 889183 | - | 252 | | Coenzyme F420-reducing hydrogenase, gamma subunit | COG 1941 | [C] |
| 0931 | 889351 | 890601 | - | 416 | | Coenzyme F420-reducing hydrogenase, alpha subunit | COG 3259 | [C] |
| 0932 | 890735 | 892306 | + | 523 | | Fe-S oxidoreductase family protein | COG 1032 | [C] |
| 0933 | 892458 | 893501 | - | 347 | | Predicted hydrolase of the metallo-beta-lactamase superfamily, contains a Zn-ribbon | | |
| 0934 | 893506 | 894342 | - | 278 | KsgA | Dimethyladenosine transferase (rRNA methylase) | COG 0030 | [J] |
| 0935 | 894329 | 895165 | - | 278 | | Predicted RNA-binding protein, contains THUMP domain | COG 2131 & COG 1818 | [F][R] |
| 0936 | 895204 | 895467 | + | 87 | | CBS-domain-containing protein | COG 0517 | [R] |
| 0937 | 895592 | 896863 | - | 423 | | Uncharacterized protein specific for M.kandleri, MK-21 family | | |
| 0938 | 896885 | 897463 | - | 192 | Isf | Iron-sulfur flavoprotein similar to Multimeric flavodoxin WrbA | COG 0655 | [R] |
| 0939 | 897491 | 898330 | + | 279 | | Uncharacterized protein conserved in archaea | COG 1650 | [S] |
| 0940 | 898801 | 899631 | - | 276 | | Predicted SAM-dependent methyltransferase | COG 2520 | [R] |
| 0941 | 899633 | 900397 | - | 254 | | Phosphate acetyltransferase family enzyme | COG 4002 | [R] |
| 0942 | 901574 | 902758 | + | 394 | ArgG | Argininosuccinate synthase | COG 0137 | [E] |
| 0943 | 902832 | 903947 | - | 371 | | ABC-type multidrug transport system, permease subunit | COG 0842 | [M] |
| 0944 | 903932 | 904639 | - | 235 | | ABC-type multidrug transport system, ATPase subunit | COG 1131 | [M] |
| 0945 | 904797 | 905420 | - | 207 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|---|----------------|------------------|
| 0946 | 905879 | 906190 | + | 103 | | Uncharacterized membrane protein specific for M.kandleri, MK-4 family | | |
| 0947 | 906696 | 908201 | + | 501 | | Uncharacterized secreted protein specific for M.kandleri, contains repeats, MK-5 family | | |
| 0948 | 908194 | 910293 | + | 699 | | Uncharacterized protein specific for M.kandleri, MK-5 family | | |
| 0949 | 910269 | 911270 | + | 333 | | Predicted membrane protein | | |
| 0950 | 911951 | 912499 | - | 182 | | Predicted phosphatase homologous to the C-terminal domain of histone macroH2A1 | COG 2110 | [R] |
| 0951 | 912898 | 913887 | + | 329 | EC M272 | Ca ²⁺ /Na ⁺ antiporter | COG 0530 | [P] |
| 0952 | 914028 | 915068 | + | 346 | | Pyruvate-formate lyase-activating enzyme | COG 1180 | [O] |
| 0953 | 915262 | 916077 | + | 271 | UbiA | 4-hydroxybenzoate polyprenyltransferase | COG 0382 | [H] |
| 0954 | 916066 | 917193 | - | 375 | | Archaeal fructose 1,6-bisphosphatase | COG 1980 | [G] |
| 0955 | 917240 | 917590 | - | 116 | EGD2 | Transcription factor homologous to NACalpha-BTF3 | COG 1308 | [K] |
| 0956 | 917639 | 918091 | - | 150 | | Prefoldin, molecular chaperone implicated in de novo protein folding, alpha subunit | COG 1370 | [O] |
| 0957 | 918107 | 919444 | + | 445 | TldD | Predicted Zn-dependent protease of TldD family | COG 0312 | [R] |
| 0958 | 919444 | 920673 | + | 409 | PmbA | Inactivated homologs of predicted Zn-dependent protease of TldD family (PmbA subfamily protein) | COG 0312 | [R] |
| 0959 | 920942 | 921322 | + | 126 | | Uncharacterized protein | | |
| 0960 | 921362 | 922747 | + | 461 | GatB | Asp-tRNAAsn/Glu-tRNA ^{Gln} amidotransferase B subunit (PET112 homolog) | COG 0064 | [J] |
| 0961 | 922744 | 923442 | - | 232 | SpeE | Spermidine synthase or similar enzyme that uses putrescine | COG 0421 | [E] |
| 0962 | 923454 | 923702 | + | 82 | | Uncharacterized protein conserved in archaea | COG 4003 | [S] |
| 0963 | 923724 | 924575 | + | 283 | | Predicted dioxygenase | COG 1355 | [R] |
| 0964 | 924582 | 925004 | + | 140 | | Uncharacterized membrane protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|---------|--|----------------|------------------|
| 0965 | 925021 | 926991 | + | 656 | MC M2_1 | Predicted ATPase involved in replication control, Cdc46/Mcm family | COG 1241 | [L] |
| 0966 | 926988 | 927662 | + | 224 | | Uncharacterized protein conserved in archaea | COG 3390 | [S] |
| 0967 | 927666 | 928082 | + | 138 | GC D7 | Translation initiation factor eIF-2 | COG 1601 | [J] |
| 0968 | 928083 | 928427 | + | 114 | | Uncharacterized conserved protein | COG 2412 | [S] |
| 0969 | 928424 | 929482 | + | 352 | | Predicted N6-adenine-specific RNA methylase containing THUMP domain | COG 0116 | [L] |
| 0970 | 929468 | 930193 | - | 241 | | Predicted hydrolase of the HAD superfamily | COG 1011 | [R] |
| 0971 | 930168 | 930926 | + | 252 | | Uncharacterized conserved protein | COG 1478 | [S] |
| 0972 | 931280 | 932956 | + | 558 | | Uncharacterized protein specific for M.kandleri, MK-8 family | | |
| 0973 | 932946 | 934205 | + | 419 | | Uncharacterized protein specific for M.kandleri with repeats, MK-6 family | | |
| 0974 | 934272 | 935483 | + | 403 | Thr C | Threonine synthase | COG 0498 | [E] |
| 0975 | 935967 | 936332 | - | 121 | | Uncharacterized conserved protein | | |
| 0976 | 936332 | 938134 | + | 600 | | Predicted membrane protein | COG 3356 | [S] |
| 0977 | 938193 | 939227 | + | 344 | | Glycosyl transferase, related to UDP-glucuronosyltransferase | COG 1819 | [GC] |
| 0978 | 939220 | 939801 | + | 193 | SEC 59 | Dolichol kinase | COG 0170 | [I] |
| 0979 | 939803 | 940735 | + | 310 | | Uncharacterized membrane protein specific for M.kandleri, MK-15 family | | |
| 0980 | 941177 | 942388 | - | 403 | | Predicted Fe-S oxidoreductase | COG 0535 | [R] |
| 0981 | 942395 | 943513 | - | 372 | | Predicted membrane-associated Zn-dependent protease | COG 0750 | [M] |
| 0982 | 943478 | 944167 | + | 229 | | Predicted nucleotidyltransferase of the DNA polymerase beta superfamily | COG 2413 | [R] |
| 0983 | 944171 | 944794 | + | 207 | | Predicted archaea-specific RNA-binding protein containing a C-terminal EMAP domain | COG 2517 | [R] |
| 0984 | 944800 | 945213 | + | 137 | | Transcriptional regulator containing DNA-binding HTH domain | COG 1846 | [K] |
| 0985 | 945361 | 945537 | - | 58 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|--|----------------|------------------|
| 0986 | 945634 | 947301 | + | 555 | LysS | Lysyl-tRNA synthetase (class I) | COG1384 | [J] |
| 0987 | 947313 | 948383 | + | 356 | | Fe-S protein related to pyruvate formate-lyase activating enzyme | COG2108 | [R] |
| 0988 | 948365 | 948892 | + | 175 | | Uncharacterized protein | | |
| 0989 | 948921 | 950180 | + | 419 | | Predicted Fe-S oxidoreductase | COG2100 | [R] |
| 0990 | 950200 | 950649 | + | 149 | RpsS | Ribosomal protein S19 | COG0185 | [J] |
| 0991 | 950650 | 951324 | - | 224 | | Uncharacterized protein | | |
| 0992 | 951376 | 952827 | + | 483 | | Fe-S oxidoreductase similar to Mg-protoporphyrin IX monomethyl ester oxidative cyclase-related protein and subunits of a Ni-chelatase for the biosynthesis of the Ni-containing coenzyme F430, which is essential for the production of methane in methanogens | COG1032 | [C] |
| 0993 | 952778 | 953764 | - | 328 | ERG12 | Mevalonate kinase | COG1577 | [I] |
| 0994 | 953789 | 954649 | + | 286 | | Uncharacterized protein conserved in archaea | COG1667 | [S] |
| 0995 | 954953 | 956260 | + | 435 | MurD_1 | UDP-N-acetylmuramoylalanine-D-glutamate ligase | COG0771 | [M] |
| 0996 | 956267 | 957001 | + | 244 | | Archaea-specific enzyme of the ATP-grasp superfamily | COG1938 | [R] |
| 0997 | 957063 | 957452 | + | 129 | | Uncharacterized conserved protein | COG1935 | [S] |
| 0998 | 957638 | 958237 | + | 199 | | Predicted cysteine protease of the transglutaminase-like superfamily | COG1305 | [E] |
| 0999 | 958234 | 959913 | - | 559 | CDC9 | ATP-dependent DNA ligase | COG1793 | [L] |
| 1000 | 960189 | 961070 | + | 293 | | Predicted serine/threonine protein kinase | COG0478 | [T] |
| 1001 | 961247 | 962146 | + | 299 | | Ferredoxin | COG1145 | [C] |
| 1002 | 962187 | 962981 | + | 264 | MhpD | 2-keto-4-pentenoate hydratase hydratase | COG0179 | [Q] |
| 1003 | 963347 | 964648 | - | 433 | | Predicted DNA-binding protein containing a Zn-ribbon | COG1571 | [R] |
| 1004 | 964675 | 964869 | + | 64 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|------|---|----------------|------------------|
| 1005 | 964874 | 965851 | + | 325 | | Predicted transcriptional regulator containing a cHTH DNA-binding domain | COG1395 | [K] |
| 1006 | 965913 | 967550 | + | 545 | GroL | HSP60 family chaperonin | COG0459 | [O] |
| 1007 | 967621 | 967887 | - | 88 | | Uncharacterized archaeal membrane protein | COG2034 | [S] |
| 1008 | 967906 | 968730 | + | 274 | SecF | Preprotein translocase subunit SecF | COG0341 | [U] |
| 1009 | 968734 | 969945 | + | 403 | SecD | Preprotein translocase subunit SecD | COG0342 | [U] |
| 1010 | 969971 | 971443 | + | 490 | TrkG | Membrane subunit of a Trk-type K ⁺ transport system | COG0168 | [P] |
| 1011 | 971489 | 972157 | + | 222 | TrkA | NAD-binding component of a K ⁺ transport system | COG0569 | [P] |
| 1012 | 972487 | 974457 | + | 656 | NtpI | Archaeal/vacuolar-type H ⁺ -ATPase subunit I | COG1269 | [C] |
| 1013 | 974472 | 977537 | + | 1021 | NtpK | Archaeal/vacuolar-type H ⁺ -ATPase subunit K | COG0636 | [C] |
| 1014 | 977572 | 978174 | + | 200 | NtpE | Archaeal/vacuolar-type H ⁺ -ATPase subunit E | COG1390 | [C] |
| 1015 | 978178 | 979302 | + | 374 | NtpC | Archaeal/vacuolar-type H ⁺ -ATPase subunit C | COG1527 | [C] |
| 1016 | 979315 | 979653 | + | 112 | NtpF | Archaeal/vacuolar-type H ⁺ -ATPase subunit F | COG1436 | [C] |
| 1017 | 979665 | 981443 | + | 592 | NtpA | Archaeal/vacuolar-type H ⁺ -ATPase subunit A | COG1155 | [C] |
| 1018 | 981484 | 982095 | + | 203 | | Uncharacterized conserved protein | COG1901 | [S] |
| 1019 | 982627 | 982932 | - | 101 | | Uncharacterized conserved protein | COG0011 | [S] |
| 1020 | 982920 | 983942 | - | 340 | | Uncharacterized protein | | |
| 1021 | 983976 | 984734 | + | 252 | | Sugar phosphate isomerase/epimerase | COG1082 | [G] |
| 1022 | 984769 | 984969 | - | 66 | | Predicted RNA-binding protein, contains TRAM domain | COG3269 | [R] |
| 1023 | 985170 | 985793 | - | 207 | | Acyl-CoA synthetase (NDP forming) | COG1042 | [C] |
| 1024 | 985790 | 986929 | - | 379 | | Pyridoxal-phosphate-dependent aminotransferase | COG0436 | [E] |
| 1025 | 986956 | 987471 | + | 171 | | Predicted transcriptional regulator of amino acid metabolism consisting of an ACT domain and a DNA-binding HTH domain | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1026 | 987473 | 988462 | + | 329 | | Uncharacterized conserved protein | COG2419 | [S] |
| 1027 | 988455 | 989405 | + | 316 | | Pyruvate-formate lyase-activating enzyme | COG1180 | [O] |
| 1028 | 989456 | 989920 | + | 154 | | ADP-ribose pyrophosphatase | COG1051 | [F] |
| 1029 | 989917 | 990534 | + | 205 | | Uncharacterized protein | | |
| 1030 | 990746 | 991507 | + | 253 | DnaN | DNA polymerase sliding clamp (PCNA) | COG0592 | [L] |
| 1031 | 991571 | 992038 | - | 155 | LepB | Type I signal peptidase | COG0681 | [U] |
| 1032 | 992204 | 993154 | + | 316 | RadA_1 | RadA recombinase | COG0468 | [L] |
| 1033 | 993238 | 994077 | - | 279 | | Metal-dependent hydrolase of the beta-lactamase superfamily | COG1234 | [R] |
| 1034 | 994067 | 995521 | - | 484 | | Uncharacterized protein | | |
| 1035 | 995608 | 998340 | + | 910 | Lhr | Lhr-like Superfamily II helicase | COG1201 | [R] |
| 1036 | 998337 | 999296 | - | 319 | | Uncharacterized protein specific for M.kandleri, MK-38 family | | |
| 1037 | 999306 | 999872 | - | 188 | CobL_1 | Precorrin-6B methylase | COG2242 | [H] |
| 1038 | 999865 | 1000527 | + | 220 | CobF | Precorrin-2 methylase | COG2243 | [H] |
| 1039 | 1000589 | 1003081 | + | 830 | PolB | B family DNA polymerase | COG0417 | [L] |
| 1040 | 1003150 | 1004791 | + | 546 | | Fe-S oxidoreductase | COG1031 | [C] |
| 1041 | 1004793 | 1009553 | - | 1586 | | Predicted protein of the CobN/Mg-chelatase family | COG1429 | [H] |
| 1042 | 1009534 | 1009770 | - | 78 | | Uncharacterized protein | | |
| 1043 | 1010030 | 1010881 | + | 283 | | Squalene cyclase | COG1657 | [I] |
| 1044 | 1010902 | 1011384 | + | 160 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|--|---------------------|------------------|
| 1045 | 1011565 | 1013082 | + | 505 | | Uncharacterized protein | | |
| 1046 | 1013137 | 1013823 | - | 228 | | L-alanine-DL-glutamate epimerase and related enzymes of enolase superfamily | COG 4948 | [MR] |
| 1047 | 1013993 | 1015405 | + | 470 | MurD_2 | UDP-N-acetylmuramoylalanine-D-glutamate ligase | COG 0771 | [M] |
| 1048 | 1015395 | 1016936 | + | 513 | HyuB | N-methylhydantoinase B | COG 0146 | [EQ] |
| 1049 | 1016944 | 1017231 | + | 95 | | Predicted pyrophosphatase | COG 1694 | [R] |
| 1050 | 1017228 | 1018340 | + | 370 | | Predicted metal-dependent hydrolase related to cytosine deaminase | COG 0402 | [FR] |
| 1051 | 1018337 | 1018726 | + | 129 | | Predicted nucleotide-binding protein related to universal stress protein, UspA | COG 0589 | [T] |
| 1052 | 1018718 | 1020367 | - | 549 | ELP3 | ELP3 component of the RNA polymerase II complex, consists of an N-terminal BioB/LipA-like domain and a C-terminal histone acetylase domain | COG 1243 | [KB] |
| 1053 | 1020723 | 1021256 | + | 177 | | Zn-dependent protease | COG 1994 | [R] |
| 1054 | 1021422 | 1022354 | - | 310 | | Predicted ATPase of the PP-loop superfamily implicated in cell cycle control | COG 0037 | [D] |
| 1055 | 1022751 | 1023809 | + | 352 | | Predicted deacetylase | COG 0123 | [BQ] |
| 1056 | 1024357 | 1026507 | - | 716 | | Predicted exporter of the RND superfamily | COG 1033 | [R] |
| 1057 | 1026786 | 1027487 | + | 233 | | Zn-ribbon-containing-protein | | |
| 1058 | 1027491 | 1028459 | + | 322 | | Fe-S oxidoreductase | COG 4004 & COG 0731 | [S][C] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|--|----------------|------------------|
| 1059 | 1028450 | 1028851 | - | 133 | | Uncharacterized membrane protein | | |
| 1060 | 1028915 | 1029487 | + | 190 | | Predicted nucleotide kinase related to CMP and AMP kinase | COG 1936 | [F] |
| 1061 | 1029500 | 1030444 | + | 314 | | Acetyltransferase (the isoleucine patch superfamily) | COG 0110 | [R] |
| 1062 | 1030519 | 1031127 | + | 202 | PDX2 | Predicted glutamine amidotransferase involved in pyridoxine biosynthesis | COG 0311 | [H] |
| 1063 | 1031140 | 1032081 | + | 313 | GltB_2 | Glutamate synthase subunit 1 | COG 0067 | [E] |
| 1064 | 1032078 | 1032770 | + | 230 | GltB_3 | Glutamate synthase subunit 3 | COG 0070 | [E] |
| 1065 | 1032777 | 1033466 | + | 229 | | Predicted PP-loop superfamily ATPase | COG 0603 | [R] |
| 1066 | 1033579 | 1033920 | + | 113 | | Uncharacterized protein | | |
| 1067 | 1033966 | 1035177 | + | 403 | | Predicted SAM-dependent methyltransferase | COG 1092 | [R] |
| 1068 | 1035174 | 1036619 | - | 481 | | Uncharacterized membrane protein specific for M.kandleri, MK-25 family | | |
| 1069 | 1036609 | 1037562 | - | 317 | Mdh | NADPH-dependent L-malate dehydrogenase | COG 0039 | [C] |
| 1070 | 1037571 | 1038509 | - | 312 | ArgF | Ornithine carbamoyltransferase | COG 0078 | [E] |
| 1071 | 1038509 | 1039858 | - | 449 | PurD | Phosphoribosylamine-glycine ligase | COG 0151 | [F] |
| 1072 | 1039833 | 1040384 | - | 183 | PyrE | Orotate phosphoribosyltransferase | COG 0461 | [F] |
| 1073 | 1040378 | 1040899 | - | 173 | CdsA | CDP-diglyceride synthetase | COG 0575 | [I] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|-------------------|------------------|
| 1074 | 1040918 | 1042417 | + | 499 | | Predicted Fe-S oxidoreductase | COG1964 | [R] |
| 1075 | 1042423 | 1043175 | + | 250 | SIR2 | NAD-dependent protein deacetylase, SIR2 family | COG0846 | [K] |
| 1076 | 1043739 | 1044446 | - | 235 | | Uncharacterized Rossman fold enzyme | COG1634 | [R] |
| 1077 | 1044460 | 1045491 | + | 343 | ArgC | Acetylglutamate semialdehyde dehydrogenase | COG0002 | [E] |
| 1078 | 1045573 | 1046004 | - | 143 | | Predicted hydrocarbon binding protein (contains V4R domain) | COG1719 | [R] |
| 1079 | 1046073 | 1046807 | - | 244 | | Metal-dependent hydrolases of the beta-lactamase superfamily II | COG1237 | [R] |
| 1080 | 1047394 | 1047978 | + | 194 | MobB | Molybdopterin-guanine dinucleotide biosynthesis protein | COG1763 | [H] |
| 1081 | 1048183 | 1049454 | - | 423 | MiaB | 2-methylthioadenine synthetase | COG0621 | [J] |
| 1082 | 1049460 | 1050929 | - | 489 | | Uncharacterized membrane protein specific for M.kandleri, MK-16 family | | |
| 1083 | 1050955 | 1052430 | - | 491 | | Predicted glycosyltransferase | COG0438 | [M] |
| 1084 | 1052589 | 1054142 | - | 517 | | Queuine tRNA-ribosyltransferase, contains RNA-binding PUA domain | COG1549 | [J] |
| 1085 | 1054126 | 1055544 | - | 472 | PurB | Adenylosuccinate lyase | COG0015 | [F] |
| 1086 | 1055634 | 1056806 | - | 390 | | Ferredoxin domain fused to pyruvate-formate lyase-activating enzyme | COG1145 & COG0535 | [C][R] |
| 1087 | 1056850 | 1057029 | - | 59 | | Nitrogen regulatory protein PII homolog | COG0347 | [E] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|----------|---|----------------|------------------|
| 1088 | 1057581 | 1058501 | + | 306 | | Uncharacterized protein conserved in archaea | COG3366 | [S] |
| 1089 | 1058600 | 1058881 | + | 93 | Ssh10b_2 | Archaea-specific DNA-binding protein | COG1581 | [K] |
| 1090 | 1058918 | 1059742 | + | 274 | | CBS-domain-containing protein | COG0517 | [R] |
| 1091 | 1059786 | 1061828 | + | 680 | HyuA_1 | N-methylhydantoinase A | COG0145 | [EQ] |
| 1092 | 1061983 | 1062237 | + | 84 | | Uncharacterized protein | | |
| 1093 | 1062427 | 1063875 | - | 482 | HyuA_2 | N-methylhydantoinase A | COG0145 | [EQ] |
| 1094 | 1063943 | 1064371 | - | 142 | | Uncharacterized domain specific for M.kandleri, MK_11 | | |
| 1095 | 1064771 | 1065691 | - | 306 | | Uncharacterized protein | | |
| 1096 | 1066239 | 1067360 | - | 373 | | Uncharacterized protein specific for M.kandleri, MK-7 family | | |
| 1097 | 1067565 | 1067867 | - | 100 | | Uncharacterized protein specific for M.kandleri, MK-45 family | | |
| 1098 | 1067881 | 1068231 | - | 116 | | Uncharacterized protein specific for M.kandleri, MK-35 family | | |
| 1099 | 1068430 | 1069563 | - | 377 | | Uncharacterized protein specific for M.kandleri, MK-7 family | | |
| 1100 | 1070068 | 1071114 | + | 348 | | Predicted extracellular polysaccharide hydrolase of the endo alpha-1,4 polygalactosaminidase family | COG2342 | [G] |
| 1101 | 1071283 | 1072530 | + | 415 | | Uncharacterized protein specific for M.kandleri, MK-32 family | | |
| 1102 | 1072764 | 1073159 | - | 131 | Fur_1 | Predicted transcriptional regulator containing a HTH DNA-binding domain | COG0640 | [K] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|----------------|------------------|
| 1103 | 1073510 | 1074421 | + | 303 | | Predicted ATPase of the PP-loop superfamily implicated in cell cycle control | COG0037 | [D] |
| 1104 | 1074418 | 1075152 | - | 244 | | Uncharacterized membrane protein specific for M.kandleri, MK-4 family | | |
| 1105 | 1075156 | 1076343 | - | 395 | | Uncharacterized conserved protein | COG1641 | [S] |
| 1106 | 1076417 | 1076743 | + | 108 | | Nitrogen regulatory protein PII homolog | COG4075 | [S] |
| 1107 | 1076740 | 1077711 | - | 323 | | Predicted metabolic regulator containing two V4R domains | COG1719 | [R] |
| 1108 | 1077887 | 1079302 | - | 471 | | NAD-dependent aldehyde dehydrogenase | COG1012 | [C] |
| 1109 | 1079336 | 1080184 | - | 282 | | Uncharacterized protein | | |
| 1110 | 1080370 | 1081089 | - | 239 | | Uncharacterized protein | | |
| 1111 | 1081197 | 1082513 | + | 438 | | Uncharacterized protein | | |
| 1112 | 1082635 | 1084164 | - | 509 | | Uncharacterized protein specific for M.kandleri, MK-8 family | | |
| 1113 | 1084374 | 1084985 | - | 203 | | Uncharacterized protein specific for M.kandleri, MK-22 family | | |
| 1114 | 1085323 | 1086447 | - | 374 | | Uncharacterized secreted protein specific for M.kandleri with repeats, MK-6 family | | |
| 1115 | 1086530 | 1088314 | - | 594 | | Uncharacterized secreted protein specific for M.kandleri with repeats, MK-6 family | | |
| 1116 | 1088392 | 1090035 | - | 547 | | Uncharacterized protein specific for M.kandleri, MK-8 family | | |
| 1117 | 1090497 | 1090760 | - | 87 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|---------|---|----------------|------------------|
| 1118 | 1090917 | 1091960 | - | 347 | | Uncharacterized protein | | |
| 1119 | 1091917 | 1092153 | - | 78 | | Uncharacterized protein | | |
| 1120 | 1092364 | 1093884 | - | 506 | MC M2_2 | Predicted ATPase involved in replication control, Cdc46/Mcm family | COG 1241 | [L] |
| 1121 | 1095025 | 1095999 | + | 324 | | Uncharacterized protein specific for M.kandleri, MK-23 family | | |
| 1122 | 1096289 | 1097245 | + | 318 | Hmd III | N5,N10-methylenetetrahydromethanopterin dehydrogenase (H2-forming) | COG 4007 | [R] |
| 1123 | 1097550 | 1097834 | - | 94 | | Uncharacterized protein conserved in archaea | | |
| 1124 | 1098197 | 1099186 | + | 329 | | Uncharacterized membrane protein | | |
| 1125 | 1099190 | 1100172 | - | 327 | | Predicted extracellular polysaccharide hydrolase of the Endo alpha-1,4 polygalactosaminidase family | COG 2342 | [G] |
| 1126 | 1101061 | 1101891 | - | 276 | FtsZ_3 | FtsZ GTPase involved in cell division | COG 0206 | [D] |
| 1127 | 1102191 | 1102478 | + | 95 | | Predicted membrane protein | | |
| 1128 | 1102596 | 1103690 | - | 364 | | Permease of the major facilitator superfamily | COG 0477 | [GE PR] |
| 1129 | 1104523 | 1105320 | + | 265 | | Predicted protease or amidase | COG 0693 | [R] |
| 1130 | 1105400 | 1105687 | + | 95 | | Uncharacterized protein | | |
| 1131 | 1107532 | 1108419 | - | 295 | | Uncharacterized protein specific for M.kandleri, MK-23 family | | |
| 1132 | 1109620 | 1110027 | + | 135 | | Uncharacterized conserved protein related to C-terminal domain of eukaryotic chaperone, SACSIN | COG 2250 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|----------------|------------------|
| 1133 | 1110240 | 1110470 | - | 76 | | Uncharacterized protein | | |
| 1134 | 1113424 | 1114281 | + | 285 | | Uncharacterized protein | | |
| 1135 | 1114332 | 1115444 | + | 370 | | Permease of the major facilitator superfamily | COG 0477 | [GE PR] |
| 1136 | 1115624 | 1116253 | + | 209 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1137 | 1116295 | 1116663 | - | 122 | | Predicted nucleotidyltransferase of the DNA polymerase beta superfamily | COG 1708 | [R] |
| 1138 | 1116684 | 1116905 | + | 73 | | Uncharacterized conserved protein related to C-terminal domain of eukaryotic chaperone, SACSIN | COG 2250 | [S] |
| 1139 | 1116898 | 1117071 | + | 57 | | Uncharacterized protein | | |
| 1140 | 1117134 | 1117373 | - | 79 | | Uncharacterized protein | | |
| 1141 | 1117370 | 1117810 | - | 146 | | Uncharacterized membrane protein specific for M.kandleri, MK-17 family | | |
| 1142 | 1117919 | 1118431 | - | 170 | | Uncharacterized protein specific for M.kandleri, MK-22 family | | |
| 1143 | 1119001 | 1119915 | - | 304 | | Uncharacterized protein | | |
| 1144 | 1120281 | 1121489 | - | 402 | | Predicted membrane protein | | |
| 1145 | 1122067 | 1122807 | + | 246 | | Predicted membrane protein | | |
| 1146 | 1122763 | 1123665 | - | 300 | | Uncharacterized membrane protein specific for M.kandleri, MK-9 family | | |
| 1147 | 1125171 | 1125659 | - | 162 | | Uncharacterized protein specific for M.kandleri, MK-5 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|----------------|------------------|
| 1148 | 1125923 | 1130821 | + | 1632 | | Uncharacterized secreted protein specific for M.kandleri with repeats, MK-5 family | | |
| 1149 | 1130814 | 1136363 | + | 1849 | | Uncharacterized secreted protein specific for M.kandleri with repeats, MK-5 family | | |
| 1150 | 1136364 | 1137101 | + | 245 | | Predicted membrane protein | | |
| 1151 | 1137105 | 1137752 | + | 215 | | Predicted membrane protein | | |
| 1152 | 1138095 | 1138991 | + | 298 | | Uncharacterized membrane protein specific for M.kandleri, MK-9 family | | |
| 1153 | 1139217 | 1139651 | + | 144 | | Predicted membrane protein | | |
| 1154 | 1139945 | 1141204 | + | 419 | | Uncharacterized membrane protein specific for M.kandleri, MK-9 family | | |
| 1155 | 1141640 | 1142470 | + | 276 | | Uncharacterized membrane protein | | |
| 1156 | 1142499 | 1142942 | + | 147 | | Uncharacterized protein specific for M.kandleri, MK-24 family | | |
| 1157 | 1143512 | 1144135 | - | 207 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1158 | 1144383 | 1145600 | - | 405 | | Uncharacterized membrane protein specific for M.kandleri, MK-9 family | | |
| 1159 | 1145844 | 1146677 | + | 277 | | Uncharacterized membrane protein specific for M.kandleri, MK-26 family | | |
| 1160 | 1146822 | 1147688 | + | 288 | | Uncharacterized membrane protein specific for M.kandleri, MK-26 family | | |
| 1161 | 1148015 | 1148680 | + | 221 | | Uncharacterized membrane protein specific for M.kandleri, MK-9 family | | |
| 1162 | 1148705 | 1149403 | + | 232 | | Uncharacterized membrane protein specific for M.kandleri, MK-17 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|----------------|------------------|
| 1163 | 1149695 | 1150318 | - | 207 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1164 | 1151111 | 1151647 | - | 178 | | Thermonuclease | COG 1525 | [L] |
| 1165 | 1151966 | 1152913 | - | 315 | | Uncharacterized protein | | |
| 1166 | 1152967 | 1154208 | - | 413 | | Uncharacterized conserved protein | COG 3287 | [S] |
| 1167 | 1155432 | 1156157 | + | 241 | | Uncharacterized protein | | |
| 1168 | 1156220 | 1157155 | + | 311 | | Uncharacterized secreted protein specific for M.kandleri, MK-6 family | | |
| 1169 | 1158073 | 1158933 | - | 286 | | Uncharacterized protein | | |
| 1170 | 1160085 | 1161410 | - | 441 | | Fusion of at least two uncharacterized domain specific for M.kandleri, MK-12 family | | |
| 1171 | 1161703 | 1162374 | - | 223 | | Predicted membrane-bound metal-dependent hydrolase | COG 1988 | [R] |
| 1172 | 1162560 | 1163432 | + | 290 | | Uncharacterized protein | | |
| 1173 | 1163540 | 1164262 | + | 240 | | Uncharacterized protein specific for M.kandleri, MK-27 family | | |
| 1174 | 1165552 | 1166187 | + | 211 | | Predicted membrane protein | | |
| 1175 | 1167028 | 1167396 | - | 122 | | Uncharacterized protein | | |
| 1176 | 1167393 | 1167758 | - | 121 | | Uncharacterized protein | | |
| 1177 | 1168689 | 1171121 | + | 810 | | Protein containing a metal-binding domain shared with formylmethanofuran dehydrogenase subunit E | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|---|----------------|------------------|
| 1178 | 1174 | 117410 | + | 968 | | Uncharacterized protein conserved in archaea | | |
| 1179 | 1174103 | 1174543 | - | 146 | | Uncharacterized protein | | |
| 1180 | 1174740 | 1175693 | - | 317 | | Uncharacterized protein | | |
| 1181 | 1176046 | 1176945 | + | 299 | | Uncharacterized protein specific for M.kandleri, MK-7 family | | |
| 1182 | 1177071 | 1177787 | - | 238 | | Uncharacterized protein specific for M.kandleri, MK-27 family | | |
| 1183 | 1178571 | 1179359 | - | 262 | | Polyferredoxin | COG 0348 | [C] |
| 1184 | 1179463 | 1179858 | - | 131 | | Uncharacterized protein | | |
| 1185 | 1179906 | 1180262 | - | 118 | | Uncharacterized protein | | |
| 1186 | 1181791 | 1182024 | + | 77 | | Uncharacterized protein specific for M.kandleri, MK-20 family | | |
| 1187 | 1182514 | 1183490 | + | 325 | | Predicted extracellular polysaccharide hydrolase of the endo alpha-1,4 polygalactosaminidase family | COG 2342 | [G] |
| 1188 | 1183487 | 1183930 | + | 147 | | Uncharacterized protein | | |
| 1189 | 1184101 | 1185807 | - | 568 | | ATPase subunit of an ABC-type transport system, contains a duplicated ATPase domain | COG 1123 | [R] |
| 1190 | 1185746 | 1186216 | - | 156 | | Uncharacterized protein | | |
| 1191 | 1186199 | 1186804 | + | 201 | | Membrane-associated phospholipid phosphatase | COG 0671 | [I] |
| 1192 | 1186783 | 1187529 | + | 248 | | Uncharacterized conserved protein | COG 0327 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1193 | 1187747 | 1189015 | + | 422 | | Predicted phosphoglycerate mutase, AP superfamily | COG 3635 | [G] |
| 1194 | 1189020 | 1189562 | + | 180 | | Predicted membrane protein | COG 1238 | [S] |
| 1195 | 1189569 | 1190054 | + | 161 | PurE | Phosphoribosylcarboxyaminoimidazole (NCAIR) mutase | COG 0041 | [F] |
| 1196 | 1190035 | 1190634 | - | 199 | CobH | Precorrin isomerase | COG 2082 | [H] |
| 1197 | 1190631 | 1192280 | - | 549 | IlvD | Dihydroxyacid dehydratase | COG 0129 | [EG] |
| 1198 | 1192330 | 1192938 | + | 202 | | Integral membrane protein of the MarC family | COG 2095 | [U] |
| 1199 | 1192943 | 1194109 | + | 388 | | Predicted GTPase of the OBG/HflX superfamily | COG 1163 | [R] |
| 1200 | 1194106 | 1194801 | + | 231 | | Uncharacterized, MobA-related protein | COG 2068 | [R] |
| 1201 | 1194798 | 1194998 | - | 66 | TatA | Sec-independent protein secretion pathway component | COG 1826 | [U] |
| 1202 | 1195047 | 1195664 | - | 205 | HyaB | Ni,Fe-hydrogenase I large subunit | COG 0374 | [C] |
| 1203 | 1195681 | 1196247 | - | 188 | | Uncharacterized protein | | |
| 1204 | 1196692 | 1196952 | - | 86 | | Uncharacterized protein | | |
| 1205 | 1196967 | 1197401 | - | 144 | | Uncharacterized protein | | |
| 1206 | 1197474 | 1197980 | - | 168 | LeuD_2 | 3-isopropylmalate dehydratase small subunit | COG 0066 | [E] |
| 1207 | 1197964 | 1198437 | - | 157 | | Predicted membrane protein | COG 3431 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|---------|--|----------------|------------------|
| 1208 | 1198443 | 1199651 | - | 402 | Leu C_2 | 3-isopropylmalate dehydratase large subunit | COG 0065 | [E] |
| 1209 | 1200171 | 1201364 | - | 397 | Leu A | Isopropylmalate synthase | COG 0119 | [E] |
| 1210 | 1201369 | 1201722 | - | 117 | | Uncharacterized conserved protein | COG 1993 | [S] |
| 1211 | 1201704 | 1202099 | - | 131 | Crc B | Integral membrane protein possibly involved in chromosome condensation | COG 0239 | [D] |
| 1212 | 1202106 | 1202915 | - | 269 | | Uncharacterized bacitracin resistance protein | COG 1968 | [V] |
| 1213 | 1203140 | 1203412 | + | 90 | | Predicted metabolic regulator containing an ACT domain | COG 3830 | [T] |
| 1214 | 1203418 | 1204770 | + | 450 | | Uncharacterized conserved protein | COG 2848 | [S] |
| 1215 | 1204838 | 1205845 | + | 335 | Leu B_2 | Isopropylmalate dehydrogenase | COG 0473 | [E] |
| 1216 | 1206266 | 1206589 | + | 107 | POP 4_2 | RNAse P subunit P29 | COG 1588 | [J] |
| 1217 | 1206586 | 1206942 | + | 118 | Rps Q | Ribosomal protein S17 | COG 0186 | [J] |
| 1218 | 1206955 | 1207356 | + | 133 | Rpl N | Ribosomal protein L14 | COG 0093 | [J] |
| 1219 | 1207371 | 1207820 | + | 149 | RplX | Ribosomal protein L24 | COG 0198 | [J] |
| 1220 | 1207835 | 1208617 | + | 260 | RPS 4A | Ribosomal protein S4E | COG 1471 | [J] |
| 1221 | 1208630 | 1209190 | + | 186 | RplE | Ribosomal protein L5 | COG 0094 | [J] |
| 1222 | 1209205 | 1209351 | + | 48 | Rps N | Ribosomal protein S14 | COG 0199 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1223 | 1209368 | 1209760 | + | 130 | RpsH | Ribosomal protein S8 | COG0096 | [J] |
| 1224 | 1209774 | 1210388 | + | 204 | RplF | Ribosomal protein L6 | COG0097 | [J] |
| 1225 | 1210401 | 1210796 | + | 131 | RPL32 | Ribosomal protein L32E | COG1717 | [J] |
| 1226 | 1210813 | 1211850 | - | 345 | PurM | Phosphoribosylaminoimidazol (AIR) synthetase | COG0150 | [F] |
| 1227 | 1211864 | 1213822 | - | 652 | | Predicted metal-dependent RNase, consists of a metallo-beta-lactamase domain and an RNA-binding KH domain | COG1782 | [R] |
| 1228 | 1213888 | 1214520 | - | 210 | HsIV_2 | Protease subunit of the proteasome | COG0638 | [O] |
| 1229 | 1214563 | 1216020 | - | 485 | ProS | Prolyl-tRNA synthetase | COG0442 | [J] |
| 1230 | 1215994 | 1217055 | + | 353 | GldA | Glycerol dehydrogenase | COG0371 | [C] |
| 1231 | 1217045 | 1217704 | - | 219 | SlpA | FKBP-type peptidyl-prolyl cis-trans isomerase | COG1047 | [O] |
| 1232 | 1217710 | 1218660 | - | 316 | SufB | ABC-type transport system involved in Fe-S cluster assembly, permease component | COG0719 | [O] |
| 1233 | 1218618 | 1219331 | - | 237 | SufC | ABC-type transport system involved in Fe-S cluster assembly, ATPase component | COG0396 | [O] |
| 1234 | 1219555 | 1220589 | + | 344 | | Uncharacterized protein | | |
| 1235 | 1220565 | 1221341 | - | 258 | | Predicted endonuclease of the RecB family | COG4998 | [L] |
| 1236 | 1221500 | 1222936 | - | 478 | | Acetolactate synthase large subunit homolog | COG0028 | [EH] |
| 1237 | 1222933 | 1223619 | - | 228 | | Predicted DNA-binding protein containing PIN domain | COG1458 | [R] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|---|----------------|------------------|
| 1238 | 1223616 | 1224314 | - | 232 | | Uncharacterized protein | | |
| 1239 | 1224388 | 1225167 | - | 259 | | MinD superfamily P-loop ATPase containing an inserted ferredoxin domain | COG1149 | [C] |
| 1240 | 1225182 | 1225970 | - | 262 | | MinD superfamily P-loop ATPase containing an inserted ferredoxin domain | COG1149 | [C] |
| 1241 | 1225978 | 1226307 | - | 109 | | Uncharacterized conserved protein | COG1433 | [S] |
| 1242 | 1226308 | 1226547 | - | 79 | | Zn-ribbon-containing protein | | |
| 1243 | 1226554 | 1226736 | - | 60 | | Ferredoxin | COG1145 | [C] |
| 1244 | 1226760 | 1227170 | - | 136 | | Uncharacterized protein conserved in archaea | | |
| 1245 | 1227252 | 1227620 | + | 122 | | CBS-domain | COG0517 | [R] |
| 1246 | 1227625 | 1228965 | + | 446 | | Acyl-CoA synthetase (NDP forming) | COG1042 | [C] |
| 1247 | 1228998 | 1229237 | + | 79 | FeoA | Ferrous ion uptake system subunit | COG1918 | [P] |
| 1248 | 1229242 | 1231194 | + | 650 | FeoB | Ferrous ion uptake system subunit, predicted GTPase | COG0370 | [P] |
| 1249 | 1231755 | 1232132 | - | 125 | | Rubrerythrin | COG1592 | [C] |
| 1250 | 1232451 | 1232984 | - | 177 | | Uncharacterized membrane protein | | |
| 1251 | 1234371 | 1235411 | - | 346 | | Uncharacterized protein | | |
| 1252 | 1236233 | 1236910 | - | 225 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------------------|---|----------------|------------------|
| 1253 | 1237175 | 1240579 | + | 1134 | | Uncharacterized secreted protein specific for M.kandleri, MK-28 family | | |
| 1254 | 1241043 | 1241195 | + | 50 | | Uncharacterized protein | | |
| 1255 | 1241416 | 1241982 | + | 188 | | Predicted RNA-binding protein containing PIN domain | | |
| 1256 | 1241966 | 1242934 | - | 322 | | Uncharacterized domain specific for M.kandleri, MK-34 family | | |
| 1257 | 1243554 | 1244471 | - | 305 | | Uncharacterized protein | | |
| 1258 | 1244552 | 1245679 | + | 375 | | Predicted hydrolase of the metallo-beta-lactamase superfamily fused to a uncharacterized domain | COG 0595 | [R] |
| 1259 | 1245681 | 1248527 | - | 948 | | Adenine-specific DNA methylase containing a Zn-ribbon | COG 1743 | [L] |
| 1260 | 1248593 | 1250761 | + | 722 | | Predicted ATPase of the AAA+ class | COG 1483 | [R] |
| 1261 | 1253762 | 1254154 | + | 130 | Fur ₂ | Fe ²⁺ /Zn ²⁺ uptake regulator similar to transcriptional regulators | COG 0640 | [K] |
| 1262 | 1254244 | 1255155 | + | 303 | | ATPase involved in chromosome partitioning | COG 1192 | [D] |
| 1263 | 1255170 | 1255841 | + | 223 | | Uncharacterized protein specific for M.kandleri, MK-29 family | | |
| 1264 | 1255904 | 1257532 | + | 542 | | Uncharacterized protein specific for M.kandleri, MK-37 family | | |
| 1265 | 1257546 | 1258277 | + | 243 | | Uncharacterized protein | | |
| 1266 | 1258311 | 1259615 | + | 434 | | Uncharacterized protein specific for M.kandleri, MK-37 family | | |
| 1267 | 1259840 | 1261165 | + | 441 | | Uncharacterized protein specific for M.kandleri, MK-37 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|---|----------------|------------------|
| 1268 | 1261784 | 1263256 | - | 490 | | Uncharacterized secreted protein specific for M.kandleri, MK-28 family | | |
| 1269 | 1264021 | 1264473 | + | 150 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1270 | 1264935 | 1265888 | - | 317 | | Uncharacterized protein | | |
| 1271 | 1266112 | 1267695 | - | 527 | | Uncharacterized protein | | |
| 1272 | 1267711 | 1269366 | - | 551 | | Uncharacterized protein | | |
| 1273 | 1269348 | 1270529 | - | 393 | | Uncharacterized secreted protein specific for M.kandleri, MK-5 family | | |
| 1274 | 1270586 | 1271590 | - | 334 | | Predicted hydrolase of the metallo-beta-lactamase superfamily | COG 0595 | [R] |
| 1275 | 1271731 | 1272240 | - | 169 | | Uncharacterized protein conserved in archaea | COG 1795 | [S] |
| 1276 | 1272292 | 1273644 | - | 450 | | Fusion of at least two uncharacterized domain specific for M.kandleri, MK-12 family | | |
| 1277 | 1274035 | 1274772 | + | 245 | | Uncharacterized protein specific for M.kandleri, MK-14 family | | |
| 1278 | 1275808 | 1277502 | - | 564 | | Uncharacterized protein specific for M.kandleri, MK-19 family | | |
| 1279 | 1277672 | 1278295 | + | 207 | | Uncharacterized protein | | |
| 1280 | 1278820 | 1279008 | + | 62 | | Uncharacterized protein | | |
| 1281 | 1279599 | 1280219 | - | 206 | | Uncharacterized protein specific for M.kandleri, MK-14 family | | |
| 1282 | 1280956 | 1281933 | - | 325 | | Uncharacterized protein conserved in archaea | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|---|---------------------|------------------|
| 1283 | 1282214 | 1283809 | - | 531 | | Fusion of at least two uncharacterized domain specific for M.kandleri, MK-2 family | | |
| 1284 | 1283981 | 1284406 | - | 141 | | Uncharacterized conserved protein related to C-terminal domain of eukaryotic chaperone, SACSIN | COG 2250 | [S] |
| 1285 | 1284412 | 1284786 | + | 124 | | Predicted nucleotidyltransferase of the DNA polymerase beta family | COG 1708 | [R] |
| 1286 | 1285068 | 1286045 | + | 325 | | Uncharacterized secreted protein specific for M.kandleri, MK-30 family | | |
| 1287 | 1286185 | 1286763 | - | 192 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1288 | 1287009 | 1287983 | - | 324 | | Uncharacterized secreted protein specific for M.kandleri, MK-3 family | | |
| 1289 | 1288128 | 1290386 | + | 752 | | Adenine-specific DNA methylase containing a Zn-ribbon | COG 1743 | [L] |
| 1290 | 1290370 | 1291122 | + | 250 | | Uncharacterized protein | | |
| 1291 | 1291279 | 1291923 | - | 214 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1292 | 1292092 | 1292835 | - | 247 | | Predicted nucleotidyltransferase of the DNA polymerase beta supefamily fused to an Uncharacterized conserved protein related to C-terminal domain of eukaryotic chaperone, SACSIN | COG 1708 & COG 2250 | [R][S] |
| 1293 | 1292953 | 1294143 | + | 396 | | Uncharacterized protein conserved in archaea | COG 4006 | [S] |
| 1294 | 1294371 | 1295660 | + | 429 | | Uncharacterized protein | | |
| 1295 | 1295771 | 1296877 | - | 368 | | Uncharacterized secreted protein specific for M.kandleri, MK-3 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|---------------------|------------------|
| 1296 | 1298182 | 1300266 | - | 694 | | Predicted component of a thermophile-specific DNA repair system, contains two domains of the RAMP family | COG 1336 & COG 1604 | [L][L] |
| 1297 | 1301091 | 1303472 | + | 793 | | Predicted DNA-dependent DNA polymerase, component of a thermophile-specific DNA repair system | COG 1353 | [R] |
| 1298 | 1303469 | 1304803 | + | 444 | | Uncharacterized protein | | |
| 1299 | 1304800 | 1305828 | + | 342 | | Predicted component of a thermophile-specific DNA repair system, contains a RAMP domain | COG 1336 | [L] |
| 1300 | 1308020 | 1308490 | - | 156 | | Uncharacterized protein | | |
| 1301 | 1308525 | 1310213 | - | 562 | | Squalene cyclase | COG 1657 | [I] |
| 1302 | 1311974 | 1312216 | + | 80 | | Uncharacterized protein | | |
| 1303 | 1312185 | 1313237 | - | 350 | | Uncharacterized domain specific for M.kandleri, MK-11 family | | |
| 1304 | 1313373 | 1314599 | - | 408 | | Uncharacterized protein specific for M.kandleri, MK-14 family | | |
| 1305 | 1314596 | 1316125 | - | 509 | | Uncharacterized membrane protein specific for M.kandleri, MK-16 family | | |
| 1306 | 1316132 | 1317607 | - | 491 | | Predicted glycosyltransferase | COG 0438 | [M] |
| 1307 | 1319237 | 1319530 | - | 97 | | Predicted nucleotidyltransferase of the DNA polymerase beta superfamily | COG 1708 | [R] |
| 1308 | 1319573 | 1321492 | - | 639 | | Predicted P-loop ATPase | | |
| 1309 | 1322642 | 1323265 | + | 207 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|---|----------------|------------------|
| 1310 | 1324335 | 1324640 | - | 101 | | Uncharacterized protein predicted to be involved in DNA repair | COG 1343 | [L] |
| 1311 | 1324652 | 1326787 | - | 711 | | Homolog of the eukaryotic argonaute protein, implicated in translation or RNA processing | COG 1431 | [J] |
| 1312 | 1326771 | 1327766 | - | 331 | | Uncharacterized protein predicted to be involved in DNA repair | COG 1518 | [L] |
| 1313 | 1329452 | 1330918 | - | 488 | | Uncharacterized domain specific for M.kandleri, MK-11 family | | |
| 1314 | 1331274 | 1334015 | + | 913 | | Predicted DNA-dependent DNA polymerase, component of a thermophile-specific DNA repair system | COG 1353 | [R] |
| 1315 | 1334017 | 1334541 | + | 174 | | Uncharacterized protein predicted to be involved in DNA repair | COG 1421 | [L] |
| 1316 | 1334554 | 1335609 | + | 351 | | Predicted component of a thermophile-specific DNA repair system, contains a RAMP domain | COG 1337 | [L] |
| 1317 | 1335611 | 1336702 | + | 363 | | Uncharacterized protein | | |
| 1318 | 1336699 | 1338027 | + | 442 | | Uncharacterized protein | | |
| 1319 | 1338024 | 1339115 | + | 363 | | Predicted component of a thermophile-specific DNA repair system, contains a RAMP domain | | |
| 1320 | 1339214 | 1339987 | + | 257 | | Predicted xylanase/chitin deacetylase family enzyme | COG 0726 | [G] |
| 1321 | 1340038 | 1340202 | + | 54 | | Uncharacterized protein | | |
| 1322 | 1340374 | 1340895 | + | 173 | | Predicted membrane protein | | |
| 1323 | 1340890 | 1341540 | - | 216 | | Metal-dependent hydrolase of the beta-lactamase superfamily | COG 1237 | [R] |
| 1324 | 1342074 | 1342703 | + | 209 | | Uncharacterized membrane protein specific for M.kandleri, MK-31 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|----------------|------------------|
| 1325 | 1342985 | 1343332 | + | 115 | | Predicted regulator of Ras-like GTPase activity, member of the Roadblock/LC7/MgIB family | COG 2018 | [R] |
| 1326 | 1344045 | 1344728 | + | 227 | | Uncharacterized domain specific for M.kandleri, MK-12 family | | |
| 1327 | 1344701 | 1345228 | + | 175 | | Uncharacterized domain specific for M.kandleri, MK-12 family | | |
| 1328 | 1345308 | 1345556 | - | 82 | | Uncharacterized protein | | |
| 1329 | 1345608 | 1346639 | - | 343 | | Uncharacterized protein specific for M.kandleri, MK-32 family | | |
| 1330 | 1346857 | 1349094 | - | 745 | | Predicted membrane protein | | |
| 1331 | 1349240 | 1350568 | - | 442 | | Uncharacterized domain specific for M.kandleri, MK-11 family | | |
| 1332 | 1351003 | 1351692 | + | 229 | | Uncharacterized protein | | |
| 1333 | 1351717 | 1352718 | + | 333 | | Uncharacterized domain specific for M.kandleri, MK-2 family | | |
| 1334 | 1352753 | 1353799 | - | 348 | | Predicted membrane-bound metal-dependent hydrolase | COG 1988 | [R] |
| 1335 | 1353804 | 1354355 | - | 183 | | Zn-dependent hydrolase | COG 0491 | [R] |
| 1336 | 1354689 | 1355963 | - | 424 | | Uncharacterized protein specific for M.kandleri, MK-42 family | | |
| 1337 | 1356271 | 1356459 | - | 62 | | Uncharacterized protein | | |
| 1338 | 1356793 | 1357287 | - | 164 | | Uncharacterized protein | | |
| 1339 | 1357826 | 1360414 | - | 862 | | Uncharacterized protein specific for M.kandleri, contains two domains of the MK-3 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|----------------|------------------|
| 1340 | 1360653 | 1361492 | + | 279 | | Uncharacterized protein | | |
| 1341 | 1361489 | 1361719 | + | 76 | | Uncharacterized protein | | |
| 1342 | 1361829 | 1362332 | + | 167 | | Uncharacterized membrane protein specific for M.kandleri, MK-31 family | | |
| 1343 | 1364466 | 1365077 | + | 203 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1344 | 1365140 | 1366013 | + | 290 | | Uncharacterized domain specific for M.kandleri, MK-34 family, a fragment | | |
| 1345 | 1366319 | 1367176 | - | 285 | | Fe-S oxidoreductase | COG 0535 | [R] |
| 1346 | 1367297 | 1368256 | - | 319 | | Uncharacterized secreted protein specific for M.kandleri, MK-3 family | | |
| 1347 | 1368270 | 1368527 | - | 85 | | Uncharacterized protein | | |
| 1348 | 1369122 | 1369865 | - | 247 | | Uncharacterized domain specific for M.kandleri, MK-2 family | | |
| 1349 | 1369858 | 1370589 | - | 243 | | Uncharacterized domain specific for M.kandleri, MK-2 family | | |
| 1350 | 1370729 | 1371478 | - | 249 | | Predicted cysteine protease of the transglutaminase-like superfamily | COG 1305 | [E] |
| 1351 | 1371767 | 1375339 | - | 1190 | | Predicted protein of CobN/Mg-chelatase family | COG 1429 | [H] |
| 1352 | 1375488 | 1376102 | + | 204 | | Uncharacterized protein specific for M.kandleri, MK-35 family | | |
| 1353 | 1376114 | 1376947 | + | 277 | | Uncharacterized protein specific for M.kandleri, MK-45 family | | |
| 1354 | 1376796 | 1377713 | + | 305 | | Uncharacterized membrane protein specific for M.kandleri, MK-10 family | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|-------|--|----------------|------------------|
| 1355 | 1378052 | 1378888 | + | 278 | | Uncharacterized membrane protein specific for M.kandleri, MK-10 family | | |
| 1356 | 1379071 | 1380000 | + | 309 | | Uncharacterized membrane protein specific for M.kandleri, MK-10 family | | |
| 1357 | 1380143 | 1380862 | + | 239 | | Uncharacterized membrane protein specific for M.kandleri, MK-10 family | | |
| 1358 | 1381069 | 1381686 | + | 205 | | Putative component of a threonine efflux system | COG 1280 | [E] |
| 1359 | 1381905 | 1382150 | - | 81 | | Uncharacterized protein | | |
| 1360 | 1382453 | 1383180 | + | 242 | | Uncharacterized membrane protein specific for M.kandleri, MK-10 family, a fragment | | |
| 1361 | 1384064 | 1385821 | + | 585 | | Calcineurin superfamily phosphatase or nuclease | | |
| 1362 | 1385837 | 1386457 | - | 206 | Nth_2 | A/G-specific DNA glycosylase | COG 0177 | [L] |
| 1363 | 1387524 | 1389643 | + | 706 | | Predicted membrane protein specific for M.kandleri, MK-13 family, a frameshift | | |
| 1364 | 1389932 | 1392763 | + | 943 | LeuS | Leucyl-tRNA synthetase | COG 0495 | [J] |
| 1365 | 1392767 | 1393741 | - | 324 | HmdII | N5,N10-methylenetetrahydromethanopterin dehydrogenase (H2-forming) | COG 4007 | [R] |
| 1366 | 1393825 | 1395282 | - | 485 | CCA1 | tRNA nucleotidyltransferase (CCA-adding enzyme) | COG 1746 | [J] |
| 1367 | 1395443 | 1396009 | - | 188 | LigT | 2'-5' RNA ligase | COG 1514 | [J] |
| 1368 | 1396144 | 1397154 | + | 336 | | Predicted ATPase of the AAA+ class | COG 1223 | [R] |
| 1369 | 1397219 | 1398223 | - | 334 | SelD | Selenophosphate synthase | COG 0709 | [E] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|---|----------------|------------------|
| 1370 | 1398408 | 1399037 | - | 209 | ThyA | Thymidylate synthase | COG0207 | [F] |
| 1371 | 1399129 | 1400016 | - | 295 | SNZ1 | Pyridoxine biosynthesis enzyme | COG0214 | [H] |
| 1372 | 1400084 | 1400647 | + | 187 | | Small, Ras-like GTPase | COG2229 | [R] |
| 1373 | 1400669 | 1401601 | + | 310 | | Uncharacterized protein | | |
| 1374 | 1401670 | 1402089 | + | 139 | | Uncharacterized protein | | |
| 1375 | 1402137 | 1402895 | + | 252 | CobM | Precorrin-4 methylase | COG2875 | [H] |
| 1376 | 1403490 | 1404254 | + | 254 | CobJ | Precorrin-3B methylase | COG1010 | [H] |
| 1377 | 1404218 | 1404622 | - | 134 | | Predicted nucleic-acid-binding protein containing a Zn-ribbon | COG1545 | [R] |
| 1378 | 1404635 | 1405819 | - | 394 | | Acetyl-CoA acetyltransferase | COG0183 | [I] |
| 1379 | 1405824 | 1406876 | - | 350 | PksG | 3-hydroxy-3-methylglutaryl CoA synthase | COG3425 | [I] |
| 1380 | 1406873 | 1407622 | - | 249 | | Predicted transcriptional regulator containing a DNA-binding HTH domain | COG1709 | [K] |
| 1381 | 1407623 | 1409290 | + | 555 | | Glycosyltransferase involved in cell wall biogenesis | COG0463 | [M] |
| 1382 | 1409287 | 1410831 | + | 514 | | Fe-S oxidoreductase | COG1032 | [C] |
| 1383 | 1410810 | 1411397 | - | 195 | | Uncharacterized membrane protein | COG1814 | [S] |
| 1384 | 1411404 | 1411694 | - | 96 | | Uncharacterized protein conserved in archaea | COG1888 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|---------|---|----------------|------------------|
| 1385 | 1411726 | 1412775 | + | 349 | NifD | Nitrogenase molybdenum-iron subunit | COG 2710 | [C] |
| 1386 | 1412760 | 1413503 | - | 247 | CitT | Di- and tricarboxylate transporter | COG 0471 | [P] |
| 1387 | 1413918 | 1414901 | + | 327 | | Predicted integral membrane protein | COG 0392 | [S] |
| 1388 | 1414907 | 1415602 | + | 231 | | Predicted ICC-like phosphoesterases | COG 1407 | [R] |
| 1389 | 1415734 | 1416798 | + | 354 | Asd | Aspartate-semialdehyde dehydrogenase | COG 0136 | [E] |
| 1390 | 1416789 | 1417262 | - | 157 | | Predicted Rossmann fold nucleotide-binding protein | COG 1611 | [R] |
| 1391 | 1417522 | 1418286 | + | 254 | TrpC | Indole-3-glycerol phosphate synthase | COG 0134 | [E] |
| 1392 | 1418283 | 1419104 | + | 273 | | Uncharacterized domain specific for M.kandleri, MK-33 family | | |
| 1393 | 1419288 | 1419860 | - | 190 | | Uncharacterized protein conserved in archaea | COG 4073 | [S] |
| 1394 | 1419851 | 1421071 | + | 406 | PRI 2 | Eukaryotic-type DNA primase, large subunit | COG 2219 | [L] |
| 1395 | 1421041 | 1421427 | - | 128 | | Zn-ribbon-containing protein | | |
| 1396 | 1421429 | 1422007 | - | 192 | | Uncharacterized protein | | |
| 1397 | 1422004 | 1422678 | - | 224 | RibB | 3,4-dihydroxy-2-butanone 4-phosphate synthase | COG 0108 | [H] |
| 1398 | 1422654 | 1423097 | - | 147 | | Transcriptional regulator of the riboflavin/FAD biosynthetic operon | COG 1339 | [K] |
| 1399 | 1423066 | 1423941 | - | 291 | RIO 1_2 | Serine/threonine protein kinase involved in cell cycle control | COG 1718 | [TD] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------------------|---|---------------------|------------------|
| 1400 | 1424001 | 1425185 | - | 394 | PncB | Nicotinic acid phosphoribosyltransferase | COG 1488 | [H] |
| 1401 | 1425410 | 1425775 | + | 121 | | Predicted metal-binding protein | | |
| 1402 | 1426225 | 1426971 | - | 248 | | Uncharacterized protein | | |
| 1403 | 1426968 | 1428236 | - | 422 | | Predicted P-loop ATPase | | |
| 1404 | 1428233 | 1429309 | - | 358 | | Translation elongation factor, GTPase | COG 0050 | [J] |
| 1405 | 1429356 | 1435184 | - | 1942 | | Predicted protein of the CobN/Mg-chelatase family | COG 1429 | [H] |
| 1406 | 1435198 | 1436574 | - | 458 | | Terpene cyclase/mutase family protein | COG 1657 | [I] |
| 1407 | 1436627 | 1437628 | - | 333 | | Predicted permease | COG 0701 | [R] |
| 1408 | 1437721 | 1438929 | - | 402 | | Predicted alternative 3-dehydroquinase synthase | COG 1465 | [E] |
| 1409 | 1438936 | 1439748 | - | 270 | FbaB | Fructose-1,6-bisphosphate aldolase of the DhnA family | COG 1830 | [G] |
| 1410 | 1439755 | 1440072 | - | 105 | | Uncharacterized protein conserved in archaea | COG 3388 | [S] |
| 1411 | 1440119 | 1441096 | - | 325 | | Predicted ornithine cyclodeaminase, mu-crystallin homolog | COG 2423 | [E] |
| 1412 | 1441454 | 1442305 | + | 283 | Kch ₂ | NAD-binding subunit of the Kef-type K ⁺ transport systems, | COG 1226 & COG 1827 | [P][R] |
| 1413 | 1442302 | 1442811 | - | 169 | | Uncharacterized protein | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1414 | 1442838 | 1444322 | + | 494 | CobQ | Cobyric acid synthase | COG1492 | [H] |
| 1415 | 1444325 | 1444906 | + | 193 | | Predicted SAM-dependent methyltransferase involved in tRNA-Met maturation | COG2519 | [J] |
| 1416 | 1444991 | 1445791 | - | 266 | NifH | Nitrogenase subunit NifH (ATPase) | COG1348 | [P] |
| 1417 | 1445815 | 1446627 | + | 270 | | Uncharacterized secreted protein | COG4086 | [S] |
| 1418 | 1446749 | 1447603 | + | 284 | NadE | NAD synthase | COG0171 | [H] |
| 1419 | 1447622 | 1447993 | + | 123 | | Uncharacterized protein | | |
| 1420 | 1447990 | 1448730 | + | 246 | | Uncharacterized protein | | |
| 1421 | 1448743 | 1449780 | + | 345 | | Uncharacterized protein | | |
| 1422 | 1449777 | 1450604 | + | 275 | DapB | Dihydrodipicolinate reductase | COG0289 | [E] |
| 1423 | 1450639 | 1451508 | + | 289 | | Uncharacterized protein | | |
| 1424 | 1452087 | 1454831 | - | 914 | ValS | Valyl-tRNA synthetase | COG0525 | [J] |
| 1425 | 1454880 | 1455605 | + | 241 | | Predicted membrane protein conserved in archaea | COG4089 | [S] |
| 1426 | 1455566 | 1456741 | + | 391 | HisC | Histidinol-phosphate/tyrosine aminotransferase | COG0079 | [E] |
| 1427 | 1456817 | 1457656 | - | 279 | | Fe-S oxidoreductase | COG0535 | [R] |
| 1428 | 1457683 | 1458321 | + | 212 | CobL_2 | Precorrin-6B methylase | COG2241 | [H] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|--|----------------|------------------|
| 1429 | 1458332 | 1459861 | + | 509 | | Fe-S oxidoreductase | COG1032 | [C] |
| 1430 | 1459862 | 1460179 | + | 105 | ModE | N-terminal domain of molybdenum-binding protein | COG2005 | [R] |
| 1431 | 1460163 | 1460975 | - | 270 | | Predicted calcineurin superfamily phosphohydrolase | COG1409 | [R] |
| 1432 | 1460972 | 1461496 | - | 174 | | Transcription factor homologous to NACalpha-BTF3 fused to metal-binding domain | COG4008 | [K] |
| 1433 | 1461502 | 1463100 | - | 532 | | ATPase subunit of an ABC-type transport system, contain duplicated ATPase | COG1123 | [R] |
| 1434 | 1463176 | 1463880 | + | 234 | KptA | RNA:NAD 2'-phosphotransferase | COG1859 | [J] |
| 1435 | 1463867 | 1464556 | + | 229 | Nfi | Deoxyinosine 3'endonuclease (endonuclease V) | COG1515 | [L] |
| 1436 | 1464534 | 1467488 | + | 984 | Top5 | Topoisomerase V | | |
| 1437 | 1467491 | 1468675 | - | 394 | CsdB | Selenocysteine lyase | COG0520 | [E] |
| 1438 | 1468781 | 1469572 | - | 263 | | Predicted RNA methylase | COG2263 | [J] |
| 1439 | 1469870 | 1472335 | + | 821 | | Uncharacterized membrane protein specific for M.kandleri, MK-13 family | | |
| 1440 | 1472310 | 1473566 | - | 418 | LeuC_1 | 3-isopropylmalate dehydratase large subunit | COG0065 | [E] |
| 1441 | 1473643 | 1474941 | + | 432 | | Replication factor A (ssDNA-binding protein) | COG1599 | [L] |
| 1442 | 1474919 | 1475872 | + | 317 | RadA_2 | RadA recombinase | COG0468 | [L] |
| 1443 | 1475944 | 1477071 | + | 375 | | Dehydrogenase (flavoprotein) | COG0644 | [C] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1444 | 1477068 | 1477274 | - | 68 | RPL24A | Ribosomal protein L24E | COG2075 | [J] |
| 1445 | 1477287 | 1477511 | - | 74 | RPS28A | Ribosomal protein S28E/S33 | COG2053 | [J] |
| 1446 | 1477629 | 1478021 | + | 130 | RPS6A | Ribosomal protein S6E (S10) | COG2125 | [J] |
| 1447 | 1478058 | 1479296 | + | 412 | | Translation initiation factor 2, gamma subunit (eIF-2gamma; GTPase) | COG5257 | [J] |
| 1448 | 1479303 | 1479695 | + | 130 | | Predicted RNA-binding protein containing PIN domain | COG1412 | [R] |
| 1449 | 1479700 | 1480290 | + | 196 | MenG | Demethylmenaquinone methyltransferase | COG0684 | [H] |
| 1450 | 1480295 | 1480825 | + | 176 | Ppa | Inorganic pyrophosphatase | COG0221 | [C] |
| 1451 | 1480832 | 1481383 | + | 183 | RpoE1 | DNA-directed RNA polymerase subunit E' | COG1095 | [K] |
| 1452 | 1481625 | 1481819 | + | 64 | RpoE2 | DNA-directed RNA polymerase subunit E'' | COG2093 | [K] |
| 1453 | 1481816 | 1482391 | + | 191 | | Uncharacterized protein conserved in archaea | COG1909 | [S] |
| 1454 | 1482334 | 1482684 | + | 116 | RPS24A | Ribosomal protein S24E | COG2004 | [J] |
| 1455 | 1482701 | 1482883 | + | 60 | RPS31 | Ribosomal protein S27AE | COG1998 | [J] |
| 1456 | 1482944 | 1483564 | + | 206 | | Mn2+-dependent serine/threonine protein kinase | COG3642 | [T] |
| 1457 | 1483561 | 1484421 | - | 286 | | Uncharacterized protein | | |
| 1458 | 1484461 | 1485501 | + | 346 | QRI7 | O-sialoglycoprotein endopeptidase | COG0533 | [O] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|-------|---|----------------|------------------|
| 1459 | 1485851 | 1486678 | + | 275 | | Uncharacterized protein | | |
| 1460 | 1486724 | 1488307 | + | 527 | SerS | Seryl-tRNA synthetase | COG0172 | [J] |
| 1461 | 1488365 | 1489000 | + | 211 | RPS1A | Ribosomal protein S3AE | COG1890 | [J] |
| 1462 | 1489038 | 1490084 | + | 348 | | Predicted RNA-binding protein, contains THUMP domain | COG1818 | [R] |
| 1463 | 1490418 | 1491233 | + | 271 | | Predicted TIM-barrel enzyme | COG0434 | [R] |
| 1464 | 1491224 | 1491904 | + | 226 | | Predicted nucleotidyltransferase of the DNA polymerase beta superfamily | COG2413 | [R] |
| 1465 | 1491877 | 1492431 | - | 184 | UbiX | 3-polyprenyl-4-hydroxybenzoate decarboxylase | COG0163 | [H] |
| 1466 | 1492501 | 1493112 | - | 203 | | Uncharacterized membrane protein | | |
| 1467 | 1493235 | 1493510 | + | 91 | | Uncharacterized protein conserved in archaea | COG4009 | [S] |
| 1468 | 1493507 | 1494061 | + | 184 | | Uncharacterized protein conserved in archaea | COG4010 | [S] |
| 1469 | 1494113 | 1494733 | + | 206 | | Predicted phosphoesterases, related to the lcc protein | COG2129 | [R] |
| 1470 | 1494730 | 1495332 | + | 200 | | Predicted HD superfamily hydrolase | COG1418 | [R] |
| 1471 | 1495427 | 1495882 | + | 151 | RpsM | Ribosomal protein S13 | COG0099 | [J] |
| 1472 | 1495896 | 1496456 | + | 186 | RpsD | Ribosomal protein related to S4 | COG0522 | [J] |
| 1473 | 1496474 | 1496887 | + | 137 | RpsK | Ribosomal protein S11 | COG0100 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1474 | 1496884 | 1497711 | + | 275 | RpoA | DNA-directed RNA polymerase alpha subunit | COG0202 | [K] |
| 1475 | 1497708 | 1498091 | + | 127 | RPL18A | Ribosomal protein L18E | COG1727 | [J] |
| 1476 | 1498106 | 1498585 | + | 159 | RplM | Ribosomal protein L13 | COG0102 | [J] |
| 1477 | 1498586 | 1498990 | + | 134 | RpsI | Ribosomal protein S9 | COG0103 | [J] |
| 1478 | 1499006 | 1499224 | + | 72 | RPB10 | DNA-directed RNA polymerase, subunit N | COG1644 | [K] |
| 1479 | 1499506 | 1500867 | + | 453 | | Uncharacterized protein specific for M.kandleri, MK-39 family | | |
| 1480 | 1501160 | 1502089 | + | 309 | PyrB | Aspartate carbamoyltransferase, catalytic subunit | COG0540 | [F] |
| 1481 | 1502086 | 1502556 | + | 156 | PyrI | Aspartate carbamoyltransferase, regulatory subunit | COG1781 | [F] |
| 1482 | 1502646 | 1503560 | + | 304 | | Transcriptional regulator of the LysR family | COG0583 | [K] |
| 1483 | 1504035 | 1505579 | - | 514 | FolP | Dihydropteroate synthase | COG0294 | [H] |
| 1484 | 1505554 | 1506294 | - | 246 | | Archaea-specific flavoprotein | COG1036 | [C] |
| 1485 | 1506320 | 1506547 | - | 75 | MtrF | N5-methyl-tetrahydromethanopterin:coenzyme M methyltransferase, subunit F | COG4218 | [H] |
| 1486 | 1506670 | 1507077 | - | 135 | | Uncharacterized conserved protein | COG1786 | [S] |
| 1487 | 1507201 | 1507398 | - | 65 | MtrA | Methyl coenzyme M reductase, alpha subunit, fragment | COG4058 | [H] |
| 1488 | 1507688 | 1508737 | + | 349 | | Fe-S oxidoreductase, related to NifB/MoaA family | COG1625 | [C] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1489 | 1508860 | 1509792 | + | 310 | CofD | 2-phospho-L-lactate transferase | COG0391 | [S] |
| 1490 | 1509797 | 1510498 | + | 233 | NfnB | Nitroreductase | COG0778 | [C] |
| 1491 | 1510584 | 1511174 | + | 196 | | Methylase of polypeptide chain release factors | COG2890 | [J] |
| 1492 | 1511252 | 1511560 | + | 102 | CutA | Uncharacterized protein involved in tolerance to divalent cations | COG1324 | [P] |
| 1493 | 1511580 | 1512938 | - | 452 | HypE_1 | Hydrogenase maturation factor | COG1973 | [O] |
| 1494 | 1513509 | 1513742 | + | 77 | | Uncharacterized protein specific for M.kandleri, MK-20 family | | |
| 1495 | 1513859 | 1514368 | - | 169 | CysG_1 | Siroheme synthase (precorrin-2 oxidase/ferrochelatase domain) | COG1648 | [H] |
| 1496 | 1514479 | 1515249 | - | 256 | | Uncharacterized protein | | |
| 1497 | 1515253 | 1516320 | - | 355 | | Uncharacterized protein conserved in archaea | COG4012 | [S] |
| 1498 | 1516295 | 1516912 | - | 205 | | Archaea-specific kinase related to aspartokinase | COG2054 | [R] |
| 1499 | 1517027 | 1517572 | - | 181 | HyaD_1 | Ni,Fe-hydrogenase maturation factor | COG0680 | [C] |
| 1500 | 1517569 | 1518687 | - | 372 | | Pyridoxal-phosphate-dependent enzyme related to glutamate decarboxylase | COG0076 | [E] |
| 1501 | 1518684 | 1519490 | - | 268 | | Predicted transcriptional regulator containing a DNA-binding HTH domain | COG1497 | [K] |
| 1502 | 1519494 | 1519919 | - | 141 | | Predicted transcriptional regulator containing the CopG/Arc/MetJ DNA-binding domain and a 3H domain | COG0864 | [K] |
| 1503 | 1519963 | 1520475 | - | 170 | | Uncharacterized conserved protein | COG1986 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|-------|--|----------------|------------------|
| 1504 | 1520450 | 1520923 | - | 157 | | Predicted nucleotidyltransferase of the HIGH superfamily | COG 1019 | [R] |
| 1505 | 1520920 | 1521717 | - | 265 | | Predicted ATPase of the PP-loop superfamily | COG 1365 | [R] |
| 1506 | 1521830 | 1522651 | - | 273 | | Uncharacterized conserved protein | COG 1430 | [S] |
| 1507 | 1522677 | 1523396 | + | 239 | | Uncharacterized conserved protein | COG 1624 | [S] |
| 1508 | 1523389 | 1524582 | + | 397 | | Archaeal S-adenosylmethionine synthetase | COG 1812 | [E] |
| 1509 | 1524636 | 1526012 | - | 458 | Ans B | L-asparaginase | COG 0252 | [EJ] |
| 1510 | 1526044 | 1526646 | + | 200 | HisH | Glutamine amidotransferase | COG 0118 | [E] |
| 1511 | 1526643 | 1527143 | + | 166 | | Predicted metabolic regulator containing V4R domain | COG 1719 | [R] |
| 1512 | 1527145 | 1527771 | + | 208 | | Predicted serine protein kinase homologous to HPr protein kinase, contains a Zn-ribbon | COG 1493 | [T] |
| 1513 | 1527775 | 1528134 | + | 119 | | Uncharacterized protein conserved in archaea | | |
| 1514 | 1528140 | 1528403 | + | 87 | | Uncharacterized conserved protein | COG 1873 | [S] |
| 1515 | 1528916 | 1529248 | + | 110 | | Predicted transcriptional regulator of the ArsR family | COG 0640 | [K] |
| 1516 | 1529214 | 1530110 | - | 298 | CbiB | Cobalamin biosynthesis protein CobD/CbiB | COG 1270 | [H] |
| 1517 | 1530110 | 1531141 | - | 343 | DPH 2 | Diphthamide synthase subunit DPH2 | COG 1736 | [J] |
| 1518 | 1531169 | 1531531 | + | 120 | CbiG | Cobalamin biosynthesis protein CbiG | COG 2073 | [H] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|---------|---|----------------|------------------|
| 1519 | 1531570 | 1532046 | + | 158 | | Uncharacterized protein conserved in archaea | | |
| 1520 | 1532641 | 1533588 | - | 315 | Dcm | Site-specific DNA methylase | COG 0270 | [L] |
| 1521 | 1533710 | 1534465 | + | 251 | | ABC-type molybdate transport system, periplasmic component | COG 0725 | [P] |
| 1522 | 1534462 | 1535247 | + | 261 | | ABC-type molybdate transport systems, permease component | COG 0555 | [O] |
| 1523 | 1535234 | 1535920 | + | 228 | | ABC-type molybdate transport systems, ATPase component | COG 3839 | [G] |
| 1524 | 1535907 | 1537154 | + | 415 | Moe A | Molybdopterin biosynthesis enzyme | COG 0303 | [H] |
| 1525 | 1537248 | 1537487 | + | 79 | Fwd G | Ferredoxin | COG 1145 | [C] |
| 1526 | 1537502 | 1537897 | + | 131 | Fwd D | Formylmethanofuran dehydrogenase subunit D | COG 1153 | [C] |
| 1527 | 1537981 | 1539282 | + | 433 | Fwd B_2 | Formylmethanofuran dehydrogenase subunit B, selenocysteine containing | COG 1029 | [C] |
| 1528 | 1539400 | 1539711 | + | 103 | | Zn-ribbon-containing protein | | |
| 1529 | 1539750 | 1541495 | + | 581 | Fwd A | Formylmethanofuran dehydrogenase subunit A | COG 1229 | [C] |
| 1530 | 1541523 | 1542326 | + | 267 | Fwd C | Formylmethanofuran dehydrogenase subunit C | COG 2218 | [C] |
| 1531 | 1542396 | 1542695 | + | 99 | | Uncharacterized protein conserved in archaea | COG 4013 | [S] |
| 1532 | 1542781 | 1544628 | + | 615 | | Predicted secreted protein | | |
| 1533 | 1544563 | 1546239 | - | 558 | | Squalene cyclase | COG 1657 | [I] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1534 | 1546215 | 1551530 | + | 1771 | | Predicted protein of the CobN/Mg-chelatase family | COG1429 | [H] |
| 1535 | 1551496 | 1552785 | - | 429 | | Aspartokinase | COG0527 | [E] |
| 1536 | 1552958 | 1554892 | - | 644 | | P-loop ATPase of the PiIT family | COG1855 | [R] |
| 1537 | 1554926 | 1555351 | - | 141 | Hisl_2 | Phosphoribosyl-AMP cyclohydrolase | COG0139 | [E] |
| 1538 | 1555348 | 1556613 | - | 421 | HisS | Histidyl-tRNA synthetase | COG0124 | [J] |
| 1539 | 1556613 | 1557965 | - | 450 | | tRNA/rRNA cytosine-C5-methylase | COG0144 | [J] |
| 1540 | 1557946 | 1558869 | - | 307 | MoaA | Molybdenum cofactor biosynthesis enzyme | COG2896 | [H] |
| 1541 | 1558896 | 1559870 | - | 324 | | Uncharacterized protein conserved in archaea | | |
| 1542 | 1560542 | 1561234 | + | 230 | | Predicted Zn-dependent hydrolase of the beta-lactamase superfamily | COG2220 | [R] |
| 1543 | 1561292 | 1562038 | - | 248 | | Uncharacterized membrane protein | | |
| 1544 | 1562041 | 1563039 | - | 332 | HypE_2 | Hydrogenase maturation factor | COG0309 | [O] |
| 1545 | 1563101 | 1563502 | + | 133 | RPS8A | Ribosomal protein S8E | COG2007 | [J] |
| 1546 | 1563499 | 1564155 | - | 218 | HypB_2 | Ni ²⁺ -binding GTPase involved in regulation of expression and maturation of hydrogenase | COG0378 | [OK] |
| 1547 | 1564142 | 1564570 | - | 142 | HybF | Zn-finger-containing protein HypA/HybF (possibly regulating hydrogenase expression) | COG0375 | [R] |
| 1548 | 1564629 | 1565369 | + | 246 | CysG_2 | Uroporphyrinogen-III methylase | COG0007 | [H] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|-------|--|---------------------|------------------|
| 1549 | 1565366 | 1566509 | + | 380 | Kch_3 | NAD-binding domain of the Kef-type K ⁺ transport system fused to a uncharacterized conserved domain | COG 1226 & COG 1827 | [P][R] |
| 1550 | 1566513 | 1567199 | - | 228 | HemD | Uroporphyrinogen-III synthase | COG 1587 | [H] |
| 1551 | 1567196 | 1567507 | - | 103 | SEC65 | 19 kDa subunit of the signal recognition particle | COG 1400 | [U] |
| 1552 | 1567473 | 1568744 | - | 423 | | Uncharacterized protein specific for M.kandleri, MK-38 family | | |
| 1553 | 1568769 | 1569284 | + | 171 | | Predicted allosteric regulator of homoserine dehydrogenase containing an ACT domain | COG 2061 | [E] |
| 1554 | 1569260 | 1570273 | + | 337 | ThrA | Homoserine dehydrogenase | COG 0460 | [E] |
| 1555 | 1570324 | 1570851 | - | 175 | | Uncharacterized protein | | |
| 1556 | 1570848 | 1571285 | - | 145 | | Uncharacterized membrane protein | | |
| 1557 | 1571504 | 1571908 | - | 134 | | Predicted redox protein, regulator of disulfide bond formation | COG 1765 | [O] |
| 1558 | 1571926 | 1572834 | - | 302 | | Selenophosphate synthetase-related enzyme | COG 2144 | [R] |
| 1559 | 1572806 | 1573468 | - | 220 | | Uncharacterized protein | | |
| 1560 | 1573487 | 1574383 | + | 298 | | Predicted permease | COG 0679 | [R] |
| 1561 | 1574882 | 1575780 | - | 299 | TrxB | Thioredoxin reductase | COG 0492 | [O] |
| 1562 | 1575813 | 1576907 | - | 364 | | Predicted flavoprotein related to choline dehydrogenase | COG 2303 | [E] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1563 | 1576935 | 1577945 | + | 336 | | Uncharacterized protein | | |
| 1564 | 1577960 | 1580194 | + | 744 | InfB_1 | Translation initiation factor 2, GTPase | COG0532 | [J] |
| 1565 | 1580201 | 1580878 | + | 225 | | Uncharacterized protein | | |
| 1566 | 1580875 | 1581339 | + | 154 | Dcd_2 | Deoxycytidine deaminase | COG0717 | [F] |
| 1567 | 1581336 | 1581887 | + | 183 | | Zn-dependent hydrolase | COG0491 | [R] |
| 1568 | 1581884 | 1582210 | - | 108 | | Predicted metal-binding protein | | |
| 1569 | 1582270 | 1583277 | + | 335 | | Permease of the major facilitator superfamily | COG0477 | [GE PR] |
| 1570 | 1583274 | 1584155 | + | 293 | MMT1 | Predicted Co/Zn/Cd cation transporter | COG0053 | [P] |
| 1571 | 1584185 | 1585000 | - | 271 | | Uncharacterized protein | | |
| 1572 | 1584936 | 1585493 | + | 185 | | Uncharacterized protein | | |
| 1573 | 1585777 | 1587114 | + | 445 | CobB_1 | Cobyrinic acid a,c-diamide synthase | COG1797 | [H] |
| 1574 | 1587128 | 1587742 | + | 204 | | Metal-dependent hydrolase of the beta-lactamase superfamily | COG1237 | [R] |
| 1575 | 1587924 | 1589219 | - | 431 | | tRNA/rRNA cytosine-C5-methylase | COG0144 | [J] |
| 1576 | 1589278 | 1590753 | - | 491 | | Amino acid transporter | COG0531 | [E] |
| 1577 | 1590858 | 1591445 | - | 195 | | Uncharacterized conserved protein | COG2411 | [S] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|---|-------------------|------------------|
| 1578 | 1591464 | 1592075 | - | 203 | RpsB | Ribosomal protein S2 | COG0052 | [J] |
| 1579 | 1592112 | 1592303 | - | 63 | | Ferredoxin | COG1146 | [C] |
| 1580 | 1592327 | 1592497 | - | 56 | RpoZ | DNA-directed RNA polymerase subunit K/omega | COG1758 | [K] |
| 1581 | 1592624 | 1593769 | - | 381 | | Predicted deacylase | COG0624 | [E] |
| 1582 | 1593766 | 1594827 | - | 353 | | Uncharacterized conserved protein | COG3367 | [S] |
| 1583 | 1594854 | 1596443 | - | 529 | HYS2 | Archaeal DNA polymerase II small subunit, predicted phosphatase | COG1311 | [L] |
| 1584 | 1596507 | 1597112 | + | 201 | | Uncharacterized protein | | |
| 1585 | 1597109 | 1597681 | + | 190 | | Predicted epimerase related to ribulose-5-phosphate 4-epimerase | COG0235 | [G] |
| 1586 | 1597665 | 1598027 | - | 120 | | Uncharacterized protein conserved in archaea | COG1698 | [S] |
| 1587 | 1597981 | 1598511 | + | 176 | | Predicted transcriptional regulator containing DNA-binding HTH domain | COG2771 & COG1284 | [K][S] |
| 1588 | 1598508 | 1598981 | + | 157 | | Uncharacterized Zn-finger-containing protein | COG1645 | [R] |
| 1589 | 1598944 | 1600101 | + | 385 | | Predicted ATP-dependent carboxylase related to biotin carboxylase | COG2232 | [R] |
| 1590 | 1600098 | 1601198 | + | 366 | MurF | UDP-N-acetylmuramyl pentapeptide synthase | COG0770 | [M] |
| 1591 | 1601232 | 1601696 | + | 154 | Ndk | Nucleoside diphosphate kinase | COG0105 | [F] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|--------|--------|--------|--------------------|--------|---|-------------------|------------------|
| 1592 | 160169 | 160301 | - | 442 | RecJ_1 | Single-stranded-DNA-specific exonuclease | COG0608 | [L] |
| 1593 | 160309 | 160354 | - | 149 | RpsO | Ribosomal protein S15P/S13E | COG0184 | [J] |
| 1594 | 160355 | 160411 | - | 188 | | Xanthosine triphosphate pyrophosphatase | COG0127 | [F] |
| 1595 | 160419 | 160598 | + | 598 | InfB_2 | Translation initiation factor 2, GTPase | COG0532 | [J] |
| 1596 | 160604 | 160685 | - | 271 | | Metal-dependent hydrolase of the aminoacylase-2/carboxypeptidase Z family | COG3608 | [R] |
| 1597 | 160686 | 160721 | - | 116 | | Uncharacterized conserved protein | COG1990 | [S] |
| 1598 | 160739 | 160776 | + | 123 | RPL8A | Ribosomal protein HS6-type (S12/L30/L7a) | COG1358 | [J] |
| 1599 | 160821 | 160894 | + | 243 | | Uncharacterized protein conserved in archaea | | |
| 1600 | 160890 | 161041 | - | 502 | GuaB | IMP dehydrogenase | COG0516 & COG0517 | [F][R] |
| 1601 | 161048 | 161105 | - | 189 | | Uncharacterized membrane protein | | |
| 1602 | 161110 | 161181 | - | 237 | | Uncharacterized protein conserved in archaea | COG1891 | [S] |
| 1603 | 161191 | 161246 | + | 183 | | Uncharacterized protein | | |
| 1604 | 161243 | 161419 | + | 587 | TopA | Topoisomerase IA | COG0550 | [L] |
| 1605 | 161464 | 161535 | + | 237 | | 5-formyltetrahydrofolate cyclo-ligase | COG0212 | [H] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|--|----------------|------------------|
| 1606 | 1615336 | 1616505 | - | 389 | ArgD | Ornithine/acetylornithine aminotransferase | COG4992 | [E] |
| 1607 | 1616509 | 1617411 | - | 300 | DapA | Dihydrodipicolinate synthase/N-acetylneuraminate lyase | COG0329 | [EM] |
| 1608 | 1617430 | 1617642 | - | 70 | RPS17A | Ribosomal protein S17E | COG1383 | [J] |
| 1609 | 1617635 | 1617913 | - | 92 | PheA | Chorismate mutase | COG1605 | [E] |
| 1610 | 1617867 | 1618727 | - | 286 | | Archaeal shikimate kinase | COG1685 | [EH] |
| 1611 | 1618931 | 1619194 | - | 87 | | Uncharacterized protein | | |
| 1612 | 1619379 | 1620722 | - | 447 | Ffh | Signal recognition particle GTPase | COG0541 | [U] |
| 1613 | 1620719 | 1621768 | - | 349 | FtsY | Signal recognition particle GTPase | COG0552 | [U] |
| 1614 | 1621798 | 1622271 | - | 157 | GIM5 | Predicted prefoldin, molecular chaperone implicated in de novo protein folding | COG1730 | [O] |
| 1615 | 1622271 | 1622513 | - | 80 | RPL20A | Ribosomal protein L20A (L18A) | COG2157 | [J] |
| 1616 | 1622531 | 1623196 | - | 221 | TIF6 | Translation initiation factor 6 (EIF6) | COG1976 | [J] |
| 1617 | 1623199 | 1623459 | - | 86 | RPL31A | Ribosomal protein L31E | COG2097 | [J] |
| 1618 | 1623475 | 1623630 | - | 51 | RPL39 | Ribosomal protein L39E | COG2167 | [J] |
| 1619 | 1623644 | 1623997 | - | 117 | | DNA-binding protein | COG2118 | [R] |
| 1620 | 1624027 | 1624476 | - | 149 | RPS19A | Ribosomal protein S19E (S16A) | COG2238 | [J] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|--|----------------|------------------|
| 1621 | 1624522 | 1624839 | - | 105 | | Predicted RNA-binding protein containing KH domain, possibly ribosomal protein | COG1534 | [J] |
| 1622 | 1624826 | 1625212 | - | 128 | RPR2 | RNAse P subunit RPR2 | COG2023 | [J] |
| 1623 | 1625166 | 1626401 | + | 411 | | Uncharacterized protein specific for M.kandleri, MK-39 family | | |
| 1624 | 1626335 | 1626904 | + | 189 | HyaD_2 | Ni,Fe-hydrogenase maturation factor | COG0680 | [C] |
| 1625 | 1626880 | 1627365 | - | 161 | | Ferredoxin fused to cHTH-type DNA-binding domain | COG1145 | [C] |
| 1626 | 1627362 | 1628921 | - | 519 | | Membrane protein implicated in protein export | COG2244 | [R] |
| 1627 | 1628934 | 1629821 | - | 295 | IlvE | Branched-chain amino acid aminotransferase | COG0115 | [EH] |
| 1628 | 1630003 | 1631064 | + | 353 | | Uncharacterized protein | | |
| 1629 | 1631048 | 1631341 | + | 97 | | Uncharacterized protein | | |
| 1630 | 1631366 | 1632712 | - | 448 | | tRNA/rRNA cytosine-C5-methylase | COG0144 | [J] |
| 1631 | 1632739 | 1633479 | + | 246 | ArgB | Acetylglutamate kinase | COG0548 | [E] |
| 1632 | 1633413 | 1633727 | + | 104 | | Uncharacterized protein conserved in archaea | COG1849 | [S] |
| 1633 | 1633814 | 1634437 | + | 207 | | Uncharacterized protein | | |
| 1634 | 1634606 | 1635241 | - | 211 | | Zn-dependent hydrolase | COG0491 | [R] |
| 1635 | 1635284 | 1636138 | + | 284 | | N6-adenine-specific DNA methylase | | |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|--|----------------|------------------|
| 1636 | 1636477 | 1637091 | - | 204 | | Uncharacterized protein specific for M.kandleri, MK-1 family | | |
| 1637 | 1637295 | 1637957 | - | 220 | | Orphan DOD family homing endonuclease | COG1372 | [L] |
| 1638 | 1637857 | 1638960 | - | 367 | | Orphan DOD family homing endonuclease | COG1372 | [L] |
| 1639 | 1639406 | 1640485 | + | 359 | | Uncharacterized conserved protein | COG1679 | [S] |
| 1640 | 1640674 | 1641513 | - | 279 | | Uncharacterized protein | | |
| 1641 | 1641667 | 1642548 | + | 293 | FtsJ | 23S rRNA methylase | COG0293 | [J] |
| 1642 | 1642496 | 1642894 | - | 132 | CpsB_2 | Mannose-6-phosphate isomerase | COG0662 | [G] |
| 1643 | 1642891 | 1644282 | - | 463 | CobB_2 | Cobyrinic acid a,c-diamide synthase | COG1797 | [H] |
| 1644 | 1644369 | 1644533 | + | 54 | | Uncharacterized protein | | |
| 1645 | 1644717 | 1645973 | - | 418 | | Predicted dehydrogenase (flavoprotein) | COG0644 | [C] |
| 1646 | 1646079 | 1647389 | - | 436 | | Predicted pseudouridylate synthase | COG1258 | [J] |
| 1647 | 1647793 | 1649076 | + | 427 | Eno | Enolase | COG0148 | [G] |
| 1648 | 1649073 | 1650479 | - | 468 | | Uncharacterized membrane protein | | |
| 1649 | 1650476 | 1651831 | - | 451 | PurF | Glutamine phosphoribosylpyrophosphate amidotransferase | COG0034 | [F] |
| 1650 | 1652250 | 1655972 | - | 1240 | | Archaeal DNA polymerase II, large subunit | COG1933 | [L] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|--------|---|----------------|------------------|
| 1651 | 1656406 | 1657362 | - | 318 | SplB | DNA photolyase | COG1533 | [L] |
| 1652 | 1657359 | 1658759 | - | 466 | LldP | L-lactate permease | COG1620 | [C] |
| 1653 | 1658795 | 1659637 | + | 280 | | Uncharacterized protein | | |
| 1654 | 1659793 | 1660500 | - | 235 | | ATPase subunit of a ABC-type transport system involved in lipoprotein release | COG1136 | [M] |
| 1655 | 1660512 | 1661624 | - | 370 | | Permease subunit of a ABC-type transport system involved in lipoprotein release | COG0577 | [M] |
| 1656 | 1661638 | 1662354 | - | 238 | | Archaea-specific Zn-finger-containing protein | COG1326 | [R] |
| 1657 | 1662382 | 1662804 | + | 140 | | Uncharacterized protein conserved in archaea | COG2090 | [S] |
| 1658 | 1662954 | 1663568 | - | 204 | | Predicted RNA-binding protein | COG1491 | [J] |
| 1659 | 1663572 | 1663961 | - | 129 | | Uncharacterized protein conserved in archaea | COG1460 | [S] |
| 1660 | 1663977 | 1664285 | - | 102 | RPL21A | Ribosomal protein L21E | COG2139 | [J] |
| 1661 | 1664287 | 1664700 | - | 137 | | RecB-family nuclease | COG4080 | [L] |
| 1662 | 1664704 | 1665924 | - | 406 | Pgk | 3-phosphoglycerate kinase | COG0126 | [G] |
| 1663 | 1665945 | 1666487 | - | 180 | | Predicted sugar phosphate isomerase involved in capsule formation | COG0794 | [M] |
| 1664 | 1666501 | 1667181 | - | 226 | TpiA | Triosephosphate isomerase | COG0149 | [G] |
| 1665 | 1667190 | 1667828 | - | 212 | RpiA | Ribose 5-phosphate isomerase | COG0120 | [G] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------------|--|---------------------|------------------|
| 1666 | 1667891 | 1669519 | + | 542 | CarB_3 | Carbamoylphosphate synthase large subunit | COG 0458 | [EF] |
| 1667 | 1669535 | 1670410 | + | 291 | PrsA | Phosphoribosylpyrophosphate synthetase | COG 0462 | [FE] |
| 1668 | 1670607 | 1670876 | + | 89 | | Uncharacterized protein conserved in archaea | COG 4014 | [S] |
| 1669 | 1670877 | 1671116 | - | 79 | | Uncharacterized conserved protein | COG 1873 | [S] |
| 1670 | 1671113 | 1671736 | - | 207 | | GTP:adenosylcobinamide-phosphate guanylyltransferase | COG 2266 | [H] |
| 1671 | 1671733 | 1672458 | - | 241 | CobS | Cobalamin-5-phosphate synthase | COG 0368 | [H] |
| 1672 | 1672455 | 1673528 | - | 357 | PgpA | Predicted phosphatidglycerophosphatase A fused to a uncharacterized conserved domain | COG 1865 & COG 1267 | [S][I] |
| 1673 | 1673554 | 1676526 | + | 990 | NtpB | Archaeal/vacuolar-type H ⁺ -ATPase subunit B, contains an intein | COG 1156 & COG 1372 | [C][L] |
| 1674 | 1676578 | 1677276 | + | 232 | NtpD | Archaeal/vacuolar-type H ⁺ -ATPase subunit D | COG 1394 | [C] |
| 1675 | 1677295 | 1677675 | + | 126 | | Uncharacterized conserved protein | COG 1417 | [S] |
| 1676 | 1677675 | 1678118 | + | 147 | | Uncharacterized protein conserved in archaea | COG 2083 | [S] |
| 1677 | 1678361 | 1678825 | + | 154 | HHT1_3 | Histone H3/H4 | COG 2036 | [L] |
| 1678 | 1678882 | 1681107 | - | 741 | MPH1/MUS81 | ERCC4-like helicase-nuclease | COG 1111 & COG 1948 | [L][L] |

| SEQ ID NO. | Start | Stop | Strand | No. of Amino Acids | Gene | Function | Homology Group | Functional Class |
|------------|---------|---------|--------|--------------------|------|--|---------------------|------------------|
| 1679 | 1681086 | 1681853 | - | 255 | | Predicted nucleotide kinase | COG 4088 | [F] |
| 1680 | 1681881 | 1682882 | + | 333 | ArsA | Predicted ATPase involved in chromosome partitioning | COG 0003 | [D] |
| 1681 | 1682894 | 1683577 | + | 227 | | Predicted phosphatase of the PHP family | COG 1387 | [ER] |
| 1682 | 1683574 | 1686540 | - | 988 | RtcB | Uncharacterized conserved protein, contains a DOD family homing endonuclease insertion | COG 1690 & COG 1372 | [S][L] |
| 1683 | 1686554 | 1687210 | - | 218 | | Uncharacterized conserved protein | COG 3382 | [S] |
| 1684 | 1687182 | 1687805 | - | 207 | | SAM-dependent methyltransferase | COG 0500 | [QR] |
| 1685 | 1687856 | 1688686 | + | 276 | | Uncharacterized protein | | |
| 1686 | 1688751 | 1689122 | + | 123 | | Uncharacterized conserved protein | COG 1504 | [S] |
| 1687 | 1689119 | 1689883 | - | 254 | PstB | ABC-type phosphate transport system, ATPase component | COG 1117 | [P] |
| 1688 | 1689888 | 1691672 | - | 288 | PstA | ABC-type phosphate transport system, permease component | COG 0581 & COG 0573 | [P][P] |
| 1690 | 1691739 | 1692728 | - | 329 | PstS | ABC-type phosphate transport system, periplasmic component | COG 0226 | [P] |
| 1691 | 1692804 | 1693688 | + | 294 | | Predicted ATPase of the PP-loop superfamily implicated in cell cycle control | COG 0037 | [D] |
| 1692 | 1693706 | 1694500 | + | 264 | | Predicted ATPase of the PP-loop superfamily implicated in cell cycle control | COG 0037 | [D] |